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Original articles, items of news and matter of interest to the Services are welcomed. Requests for reprints should be made at the time of forwarding articles.

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THE
MILITARY SURGEON
VOL. XLI NOVEMBER, 1917 NUMBER 5

ORIGINAL ARTICLES

Authors alone are responsible for the opinions expressed in their contributions

PROCEEDINGS OF THE TWENTY-FIFTH ANNUAL MEETING OF THE ASSOCIATION OF MILITARY SURGEONS OF THE UNITED STATES. HELD AT THE MEDICAL OFFICERS, TRAINING CAMP, FORT BENJAMIN HARRISON, IND., OCTOBER 8, 9 and 10, 1917.

THE MINUTES OF THE MEETING

THE twenty-fifth annual meeting of The Association of Military Surgeons of the United States convened at Fort Benjamin Harrison, Indiana, October 8, with Surg. Gen. Rupert Blue, U. S. P. H. S., President, in the chair.

Quite a thousand members reported present, the largest attendance in the annals of the Association, making it impracticable to publish the names. Many of our honored veteran members were on duty and greatly added to the success of the meeting.

The order of procedure was as follows:

SUNDAY EVENING, OCTOBER 7, 7 P. M.

Assembly

1. Camp fire smoker and acquaintance meeting.
   Talk by Major General Gorgas, Surgeon General, U. S. Army.
2. Meeting of Executive Council.

MONDAY, OCTOBER 8, 9 A. M.

Business Session

Address of President, Surgeon General Rupert Blue, U. S. P. H. S.

Reports of Executive Council, Secretary-Editor, Treasurer, Committee on Arrangements, Literary Committee, Committee on Legislation, Boards of Award, Necrology Committee, Sinking Fund Committee, Appointment of Nominating Committee and Committee on Resolutions, Consideration of Amendments to Constitution and By-Laws, Miscellaneous Business.

3. "Tuberculosis in France," Maj. Edouard Rist, Medical Department, French Army.

4. "Coöperation of the Civilian Medical Profession with the Medical Services of the Government in Time of War," Maj. Victor C. Vaughan, M. R. C., U. S. A.

MONDAY, 1 P. M.

Second Session

1. "Practical Medical Military Lessons of the War," Col. T. H. Goodwin, C. M. G., D. S. O., R. A. M. C.

2. Symposium—"How Medical Military Services of the Government May Best Coöperate in Time of War," Col. Louis A. LaGarde, M. C., U. S. A., ret.; P. A. Surg. W. E. Eaton, U. S. N.; Asst. Surg. Gen. W. Colby Rucker, U. S. P. H. S.

3. Address, Maj. Jos. C. Bloodgood, M. R. C., U. S. A.

Parade and Review, M. O. T. C.

MONDAY, 5.30 P. M.

Third Session

Barbecue Supper, Bonfires and Singing.

8 P. M.

1. "Medical Service on the Western Front," Col. Charles Dercle. Medical Department, French Army. Motion Pictures.

TUESDAY, OCTOBER 9, 8 A. M.

Fourth Session

1. Report of the Nominating Committee and other business.

2. Election of Officers.

3. Addresses, Col. T. H. Goodwin, British Medical Service.

4. "Transportation of Wounded on Western Front," Capt. J. Gilmour, R. A. M. C.

5. "Trench Warfare," Lieut. Henry Haye, French Infantry.

TUESDAY, 1 P. M.

Fifth Session

Field Demonstration of Medical Department Activities.

TUESDAY, 7 P. M.

Sixth Session

"Medical Service on the Western Front" (concluded), Col. Charles Dercle, Medical Department, French Army.

1. "War Neuroses" (illustrated), Maj. Thos. H. Salmon, M. R. C., U. S. A.
2. Bonfires and Entertainment by M. O. T. C.

WEDNESDAY, OCTOBER 10, 8 A. M.

Seventh Session

"An Efficient State Medical Department," Lieut. Col. Jacob Frank, M. C., Ills. N. G. (Read by title.)

1. Installation of Officers.
2. Report of Auditing Committee, Committee on Resolutions, etc.
3. Unfinished Business.
4. Adjournment.

The environment was so distinctly military and the hospitable welcome by Colonel Ashburn and his officers so warm, that no one could fail to feel at home and, following the rule of the soldier game, begin by hustling for bed and board. It was all there and more, to have for the asking, and the kindly hospitality of the Medical Officers' Training Camp, Fort Benjamin Harrison, Indiana, will be a pleasant memory to us all. The "assembly" was the occasion of the gathering of the clan during which old comrades met and renewed acquaintance, exchanging reminiscences of early days and early members of the Association, now gone on; while new ones came to be welcomed into our increasing flock and made part of an organization which has always promised and is now realizing on its promise, to be the great military medical association of the world.

It was on this occasion that we listened to an inspiring address by General Gorgas, modest, logical, impressive; carrying the weight of great authority of things done and doing, his kindly words of advice and encouragement were an inspiration to us all.

The formal opening of the meeting occurred at 9 o'clock, Monday morning, on the parade ground. Indeed all of the meetings were held in the open, the weather being propitious, except the closing session, which the skies, apparently weeping at the thought of our departure, forced us to hold in *tabernaculum cal factorium sine ventosum.*

Surgeon General Blue, U. S. P. H. S., our president, called the meeting to order and addressed it as follows:

PRESIDENT'S ADDRESS

Members of the Association and Invited Guests: It is no less a privilege than it is an honor to call to order the annual meeting of the Association of Military Surgeons of the United States. It had been my purpose, in keeping with the precedent of many years, to deliver a presidential

address upon the advances which have been made in our science since the beginning of the war, but since we have with us distinguished representatives, both of the British and the French armies, I shall be glad to sit at their feet and learn, firm in the belief that you will receive more benefit from their lectures and demonstrations than from anything which I might say to you.

Over a quarter of a century ago a number of far-sighted, patriotic physicians in the military service of our country met at Chicago for the purpose of creating an organization for the increase of medical, surgical and sanitary knowledge among the medico-military men of this country. Out of this meeting was born the Association of Military Surgeons of the United States, an organization which was destined to occupy a very definite and important position in the affairs of the nation and which, it is hoped, will eventually lead to a better understanding and coördination of the medical services, not only of the United States but of all of her allies as well.

When this Association was formed, war seemed a remote contingency. Seven years later the members of this organization, both individually and collectively, were put to the test, and it is needless to state that they performed their duties so faithfully and intelligently as to give a lasting impetus to medico-military science. The organization has passed through days of prosperity and of adversity; it has seen days of plenty and days of penury, but the spirit which animated Colonel Senn and the other founders of this organization has ever burned brightly, and it is with great pride and much happiness that I am able to tell you today that never before has the Association of Military Surgeons been on such a solid moral and financial status.

Two years ago the affairs of our organization were at low ebb, the membership was beginning to lose interest, the resignations for a while exceeded the admissions, and the comfortable balance which once existed in the treasury was suffering a gradual but nevertheless certain process of fatal attrition. It will be recalled that a Committee on Membership was appointed at the 1914 meeting. Through correspondence and personal solicitation this body of officers succeeded in developing throughout out country a sentiment which was favorable to the Association. The full effect of the work of this committee was not felt, however, until the spring of 1916. By that time our very efficient secretary, Colonel Munson, was well seated in his office and had gathered up the tangled reins of administration. Too much cannot be said in praise of the whole-hearted, untiring and devoted labor which this officer has expended for the Association. To him more than to any other one man is due the splendid condition of this organization today. It would be

unfair, however, to leave unmentioned the splendid way in which Colonel Hoff, recalled from the ease of retirement, put his sturdy shoulder to the wheel; nor should the very arduous labors performed by Major Ullrich pass unnoted. The members of the Council have been unfailing in their responses to calls for advice and assistance. When the cloud of war hung black a year ago and it was impossible to hold the annual meeting, the Council cheerfully continued the administration of the affairs of the Association, and many of the members travelled many weary miles on many different occasions at their own expense to attend the meetings of that body. Under the brilliant inspiration of the secretary and the solid advice of Colonel Hoff, the Council, assisted by the ex-presidents, was called upon to map out new policies, to undertake new projects, and to enter new fields. This would not have succeeded had it not been for a boundless faith which all of us felt in the possibilities of this Association. There were times when daring financial steps were taken, when many of us would have drawn back from experimental advances had it not been realized that the ultimate destiny of the Association of Military Surgeons of the United States was to do great things in a great way.

And so, success is beginning to come to us. Two years ago there was less than $1,800 in the treasury, and there was a time, after all outstanding liabilities had been met, that the Association had exactly $71.20 in the bank. Today we have an unencumbered balance of over $10,000. Two years ago there were less than 800 paid members, today there is a total membership of 4,366. We have a journal of military medicine which is without a superior in the world, and we have a membership which is enthusiastic in carrying forward the spirit of the purposes of this body.

When we last met many of us felt that it would not be long before we would be obliged to put into practice, and under the rigors of war, the theories and the precepts over which we had been working for so many years. The prevention of disease and the alleviation of the wounds and sicknesses of war are tasks not lightly to be undertaken, nor without long and careful preparation. I think we can say with all modesty that we have been able to bring to our colleagues in the allied armies some advances in the science of our art, and with all gratitude we acknowledge the many things which they have been able to teach us.

A moment ago I said that the successes of this organization are just beginning. Whether or not they will continue is entirely dependent upon you. Strive as they may, the officers of the Association cannot possibly carry on the burden unaided. Each of you must do his part. Each of you must feel that in working for the Association you are working for our nation. Each of you must be filled with the spirit which

earnestly desires that this organization shall extend its useful mission not only throughout the United States but throughout the allied nations. Heroic France battling to the last drop of her valiant blood, enslaved Belgium, broken but not crushed, grim England, upholder of justice, the new-born Russia, courageous Italy and all our other allies need us and our work, and in order that our efforts may be crowned with success we must harmonize our ideals and our practices with theirs.

I cannot close without referring to the wonderful way in which this war of wars is moulding the destiny of the entire medical profession. On the shell-torn fields of France old theories and methods of procedure are being subjected to the acid test of war. The practices of emergency surgery are being tried out on a scale so vast as almost to baffle the imagination. Physicians from all parts of the world are being brought together with a resultant interchange of thought and experience. Men who a few months ago were interested only in the cure of disease now find themselves working for its prevention. Inspiration and knowledge are being imparted to thousands who were beginning to be worn down by the routine of existence. The social aspects of medicine and surgery are being developed as never before, and when this war shall have ceased, the finest body of medico-sanitary soldiers that the world has ever seen will be returned to civil practice. Out of this war the general public is learning the lesson that upon the physical condition of its citizens are dependent its integrity and continuance. Civil zones, to which a few months ago the word "sanitary" was a nebulous sort of term, have taken to heart the lessons of Hygeia. Whole communities whose hygienic environment was the most primitive are witnessing a lowering of their morbidity and mortality rates by reason of the earnest cooperation of their citizens with the sanitary forces of the Government. Just as this war has raised the science of human destruction to the *n*th power, so out of the sorrow and suffering of this great conflict will come more accurate and better methods for the conservation of human life. Ere this has been accomplished the bones of many will whiten the fields of France, and the wrecked and broken bodies of thousands will have been offered up on the altar of patriotism. To those who thus sacrifice themselves in the exemplification of the motto of this Association, "omnia pro patria caritate," we do all honor, firm in the belief that their oblation has been made in unselfish devotion to the physical and moral welfare of mankind.

Following the President's address Maj. Edouard Rist, of the Medical Department of the French Army, read a paper on Tuberculosis, which, with the other important professional papers presented to the meeting, will appear later in THE MILITARY SURGEON.

Upon competition of Major Rist's paper, the president introduced to the Association our honored guests as follows: "It is a privilege and pleasure to admit to honorary membership in the Association the four distinguished representatives of the Medical Services of our allies across the waters, Colonel Dercle, Colonel Goodwin, Major Rist and Captain Gilmour, and to decorate them with the badge of our organization."

When bestowing the badges Colonel Munson spoke as follows:

"Col. Charles Dercle, Army of France, Member of the Legion d'Honneur, recipient of the Croix de Guerre, bearer of many wounds, cited in orders for bravery, representative of a republic with which our country has long been united in bonds of sentiment, in accordance with the action of this Association, you are hereby admitted to its membership and invested with its insignia.

"Col. Thomas H. Goodwin, British Army, representative of a nation with whom we are united in blood, sympathy and arms, Companion of the Distinguished Service Order for bravery in battle, soldier of many wars, author, educator and director of relief work on the battlefield, this Association inducts you into its membership and endows you with its insignia, in token of these achievements, and especially for the great assistance you have redered the cause of medical preparedness in this country.

"Maj. Edouard Rist, Army of France, Member of the Legion d'Honneur, twice wounded in battle, soldier-scientist of the indomitable France whose bravery challenges the admiration of the world, in admitting you to its membership, and bestowing on you its insignia, the Association is itself honored.

"Capt. John Gilmour, R. A. M. C., British Army, decorated by your king for heroism in battle, participant in campaigns in East Africa, Gallipoli and Flanders, representative of an ally with whom we share a common ideal, we welcome you into membership and, in evidence thereof, affix our emblem."

Upon completion of this ceremony Surgeon-General Braisted, U. S. Navy, upon request of the Chair, spoke imformally.

"Mr. President and members of the Association, it is a great pleasure for me to be here today and I wish that I might remain during the meeting, but I must leave for Chicago. The chief function of the Navy, as you know, is far from the interior and from the fighting front ashore, but I think you will be interested to hear that all our work is progressing on exactly the same lines as yours. Two of the base hospitals are ready for the reception and care of patients, and the Navy work at home—on this side of the water—is almost complete, so far as organization, personnel, supplies and equipment are concerned. We are busy now

with the details of organization on the other side, for base hospitals are going with our army marines.

"Some years ago when president of this Association, I predicted that the time would come when membership therein would be one of the most highly prized that man might have. I had no idea that it would be realized so soon, but the time has come when The Association of Military Surgeons should be the highest medical expression that we have in this country.

"I think, gentlemen, that you will have one of the best and most enlightening meetings at this session that you have ever had, and I feel that much good will come from it."

The business of the session was then proceeded with. The secretary presented the report of the Executive Council, giving a résumé of the minutes of the fourteen formal meetings held in the interval elapsing since the twenty-fourth annual meeting of the Association, and indicating how efficiently the interests of the Association had been guarded and promoted during this period in which one annual meeting was necessarily omitted. This report on motion was adopted.

Colonel Munson then made the report of the secretary as follows:

REPORT OF THE SECRETARY

Medical Officers' Training Camp,
Fort Benj. Harrison, Ind.,
October 7, 1917.

Mr. President, and members of the Association of Military Surgeons of the United States, I have the honor to render herewith a report of the activities of the office of the secretary-editor of this Association for the period from January 1, 1916, to date.

This is the first opportunity which the present secretary's office has had of reporting to the Association, as the annual meeting for 1916 was not held as a result of military conditions which required the absence on the border of a majority of members.

It is gratifying that the report now rendered can be a report of unprecedented progress. How material this progress has been is shown by the following comparative facts.

On January 1, 1916, the nominal membership of our organization had dwindled to 820, and even of this number many were of doubtful status and in arrears for dues for several years. It was deemed undesirable to send out bills until the proposed reorganization had become an accomplished fact. Since that date there has been a large and steady increase in both membership and interest.

The following is the membership to date, in good standing:

		For election	*Total*
Army: Regular officers	334	1	335
Reserve officers	2,387	736	3,123
Navy	174	0	174
Public Health Service	132	1	133
National Guard	557	1	558
Honorary	57	4	61
Total			4,384

During the last quarter, new members have joined the Association at the rate of about 300 per month, and a total membership several times its present size may be expected in the early future.

Since January 1, 1916, THE MILITARY SURGEON has been completely reorganized and doubled in size. The extent to which it has been improved in appearance and in value of contents each member must judge for himself. The former dearth of high class matter has changed to a plethora for which the difficulty is to find space, for all of it should be printed.

In the subjects of its activity, THE MILITARY SURGEON is recognized everywhere as an authority and is widely quoted the world over. It has taken its place in the front ranks of the publications of medical journalism and military expression.

The secretary's office has proceeded on the assumption that the dignity and importance of this Association demanded that its official mouth-piece should be a publication of the first class. It also felt that there was not only a place for such a publication but that it could be made a very great financial success. Events have proved the correctness of this assumption. If THE MILITARY SURGEON is not the best magazine of its kind in the world, it is proposed to make it so, for the necessary personnel, matériel and funds are available.

The circulation of THE MILITARY SURGEON is as follows:

Members, as above itemized	4,384
Subscribers	431
Exchanges	58
Advertisers	114
Total paid circulation	4,997

With the propaganda for membership and advertisers, an edition of about 6,000 copies is now required.

Eighteen months ago, the annual cost of THE MILITARY SURGEON was $3,100. At the present time, THE MILITARY SURGEON is costing over $20,000 annually, or nearly seven times as much. But every step implying increased expenditure was first financed in advance.

The cost of publication seems high. However, of recent bids submitted by various publishers, the present printers of THE MILITARY SURGEON submitted the lowest offer.

The war has made the cost of the journal relatively very great. Paper stock is increasingly expensive. It is impossible to obtain at any price the quality of paper which it is desired to use.

For a considerable time, the cost of the journal was in excess of the dues paid by members. As the size of the edition increases, this relative cost is being reduced.

The mailing list had apparently not been revised in a number of years. Very many hundreds of magazines were going gratuituously to persons not entitled to them, and a large amount of money thereby lost to the Association. This has been stopped.

The campaign for advertisers and new members has cost about $2,000. That this money was wisely thus spent is evidenced by the fact that it has brought into the Association about $10 in new money for every dollar so invested.

On January 1, 1916, the total assets of the Association, after all bills were paid, amounted to just $71.60. At the present moment, the Association does not owe a dollar and it has a surplus in the bank of $13,338.07 as reported by the treasurer.

The necessity for surrounding the surplus with additional safeguards is taken up in the report of the Committee on Sinking Fund.

The business of the Association has jumped from one of a few thousands a year to $35,000, and is steadily increasing. Of this, the secretary's office necessarily handles about two-thirds, from the propaganda for members and receipts from advertising. One clerk is at present employed. As the business further expands, additional assistance will be necessary.

The salary of the treasurer has been increased during the year from $25 to $75 monthly. Service on the border, and assignment to duty with troops, have twice taken Major Ullrich from his duties as treasurer, they being assumed by Assistant Surgeon General Rucker.

While the treasurer has well and faithfully carried out the duties of his office, the experience of many years seems to have demonstrated the impossibility of maintaining proper business team-play with the respective offices of the secretary and treasurer located other than in the same city. The business affairs of the Association are no longer small. They have expanded into a large commercial enterprise destined to enjoy still greater growth. The necessity of running this great enterprise along proper business lines is commended to the Association.

There is no reason to apprehend any falling from present standards. The policies which have been so successfully inaugurated in the past

should bring equally successful results in the future. It is true that participation in the war by this country has materially added to the opportunities for success of the Association; but such participation was not necessary to this, for some nine months before war was declared our membership had been doubled and the increased cost of the reorganized MILITARY SURGEGN had been completely financed.

The secretary would here call attention to the fact that out of every war in the history of this country have developed great patriotic societies devoted to national betterment.

For medical officers of all the services this great patriotic society, for the present war and all future wars, exists preformed in our Association, which by Act of Congress of the United States, dated January 30, 1903, was constituted "for the purpose of advancing the knowledge of military surgery, medicine, and sanitation in the medical departments of the Army, the Navy, and the Marine-Hospital Service of the United States and of the militia of the different States, and to increase the efficiency of the different services by mutual association and the consideration of matters pertaining to the medico-military service of the United States in peace and in war.

"Sec. 2. That this Secretary of the Treasury, the Secretary of War, the Secretary of the Navy, the Surgeon-General of the Army, the Surgeon-General of the Navy, and the Surgeon-General of the Marine-Hospital Service shall be *ex officio* members of the Association of Military Surgeons of the United States, and with the president of the Association, shall act as an advisory board to the said association."

This Act of Congress gives our Association an official status in closer relation to the Government than is enjoyed by any other organization. It becomes our duty to make it the rallying center of the medico-military branch of the profession, and the medium of expression between it and the Government. With its expansion, the time seems to have come for the organization of the Association as a whole into state and other local branches, as befits a national body of such importance.

The value of our Association as an educational force has also been recognized by the Surgeons-General of the Army, Navy and Public Health Service, the Chief Bureau of Militia Affairs, the Chief, Bureau of Naval Militia, and the Medical Section, Council of National Defense, all of whom have issued official circulars urging persons eligible to membership to join our organization.

The thanks of the Association are due to Mr. Henry S. Wellcome for the annual prizes of a gold and silver medal, with $500 cash, which he has so generously offered since our last meeting.

The award of the above prizes for 1916 has already been announced.

The Executive Council has decided to withdraw the prize competition for 1917, feeling that no such outside distractions should operate to reduce the maximum efficiency of members in their present tasks of war.

Due to absence of the secretary on the border mobilization, and later to pressure of other duties incident to the war, the work of the secretary's office, for more than a year, practically has been conducted by Col. John Van R. Hoff, U. S. Army, retired, associate editor and secretary *ad interim*. With characteristic self-sacrifice, Colonel Hoff has performed its arduous duties in a most able manner. It is regretted that he is not present at this meeting to receive evidence of the appreciation in which his wise counsel and faithful and efficient service are held by the Association in whose interests he has done so much.

The secretary desires to acknowledge with sincere thanks the support given his office at all times by the president of this Association and the members of its Executive Council. It has done much to lighten a burden of no small magnitude. There have been fourteen meetings of the Executive Council, which indicates how carefully the affairs of the Association have been supervised.

In a psychological sense, the Association has enjoyed a period of great uplift. Never have its members been more loyal to the organization and enthusiastic in its betterment. The success of the Association is not due to any one man or any group of men, but to the team-work of the members themselves. They have responded loyally to every demand made upon them. In every way they have supported the officers of the Association along the lines of improvement and progress. In what has been accomplished they have had full share. For the future, they have further and wider opportunity for usefulness in the strengthening and expansion of the Association.

With achieved success behind us, we may look forward, in all confidence, to a brighter future and larger opportunity.

On motion of General Griffith, seconded by Dr. Rucker, the report of the secretary was accepted, and a vote of thanks extended to the secretary was carried.

Colonel Ashburn, reporting as chairman of the Committee of Arrangements, submitted the program of the meeting.

Informal reports were submitted by the other standing committees and this phase of the session was closed by the report of the Committee on Necrology, submitted by the chairman, Brig.-Gen. Saml. C. Stanton, M. C., Ills. N. G., retired. This report was received standing and ordered filed.

The treasurer *ad interim*, Dr. Rucker, then submitted his report, of which the following is a résumé:

REPORT OF THE TREASURER

Mr. President and members of the Association, I shall not burden you with a long report. I may state, however, that the affairs of the Association in a financial way are the best in its history. The office of treasurer during the last two years was first in the hands of Major Ullrich, then in my hands, then back to Major Ullrich's hands and now back into my hands. I will first give you a report of Major Ullrich, from December 9, 1915, to July 15, 1916:

He received from the retiring treasurer	$1,971.44
His total receipts other than that were	7,111.18
Making a total	$9,082.62
His disbursements were	6,823.03
Leaving a balance of	$2,259.59

I then held office of treasurer *ad interim* until April 1, 1917.

I received from the treasurer	$2,259.59
Receipts other than that	9,816.09
Making a total of	$12,075.68
Of which there were disbursed	8,301.53
Leaving a balance of	$3,774.29

This amount of money was transferred to Major Ullrich, April, 1917.

Received from treasurer *ad interim*	$3,774.29
Received in addition to this	7,614.63
Making a total of	$11,389.92
Major Ullrich disbursed	2,307.55
Leaving a balance of	$9,082.37

I received this amount on the 27th of August, 1917, and have collected to October 6, 1917, $1,191.88, making a total of $10,274.25 of which I have spent $247.00, leaving a balance of $10,037.25. In addition to this amount, the secretary has in the bank $326.82 and since I have been here I have received $2,974, making a total on hand of $13,338.07 against which there are no encumbrances whatever. During the last two years the treasurer has been very busily engaged collecting monies due the Association and I can say to you that, of the 4,366 members of the Association, only 428 owe money to this body.

I may say that the members of the Association are fully aware of their obligation in the payment of bills and are meeting the bills as fast as they fall due. The treasurer finds that a clerk in error sent out a lot of bills for $5.00 dues instead of $4.00, but everybody came through with their $5.00 and the extra dollar has been credited on the dues for 1918.

The proposed amendments to the constitution and by-laws were then submitted to the meeting and are set forth as follows:

[Proposed additions in blackface type; proposed eliminations in brackets.]

CONSTITUTION AND BY-LAWS OF THE ASSOCIATION OF MILITARY SURGEONS OF THE UNITED STATES[1]

PREAMBLE

The Medical Officers of the Army, of the Navy, of the Public Health [and Marine-Hospital] Service of the United States, and of the Organized Militia of the Different States, under the provisions of an act of Congress approved January 30, 1903, *have associated themselves together under the name of "The Association of Military Surgeons of the United States." Now, therefore, pursuant to the laws of the United States, the members of said Association do hereby ordain and enact the following:*

CONSTITUTION

Article I

NAME

The Association shall be known as "The Association of Military Surgeons of the United States."

Article II

OBJECT

The object of the Association shall be to increase the efficiency of the medical services of the Army, the Navy, the Public Health [and Marine-Hospital] Service, and of the Organized Militia of the different States by mutual association and the consideration of matters pertaining to the medico-military service of the United States both in peace and in war.

Article III

MEMBERS

Classification of Membership

Section 1. There shall be Active, Life, Associate, Ex-Officio, and Honorary Members.

[1]Adopted [September 26, 1911].

Members Eligible to Office and Entitled to Vote

Sec. 2. Active and Life members only are eligible to office or entitled to vote.

Active Members

Sec. 3. Active membership is limited to commissioned medical officers of:

(1) The United States Army;

(2) The United States Navy;

(3) The United States Public Health [and Marine-Hospital] Service;

(4) The Organized Militia of the several States;

(5) The United States Volunteers;

(6) Acting Assistant Surgeons (Contract Surgeons) of the U. S. Army, Navy and Public Health Service. (Offered at the 1915 Meeting.)

(7) The National Army.

Active members may retain their membership, should they be honorably discharged from the service in which they have been commissioned, and nothing in this Article shall affect the membership rights of Contract or Acting Assistant Surgeons of the United States Army, Navy, or Public Health [and Marine-Hospital] Service who were duly elected prior to the adoption of this Constitution.

Life Members

Sec. 4. Life membership and exemption from payment of annual dues is conferred upon—

1. Members who obtain first honorable mention in the prize competitions of the Association.

2. Any active member upon the payment of fifty dollars at one time.

3. **Former** [Ex]-presidents of the Association.

Associate Members

Sec. 5. Associate membership is open to—

1. **Former** [Ex-]medical officers and

2. Other officers of the aforementioned services;

3. **Former** [Ex]-medical officers of the Confederate Army and Navy, and

4. Medical officers of foreign services;

5. Officers of the Dental, Veterinary and Sanitary Corps, and Army Ambulance Service.

Ex-Officio Members

Sec. 6. The Secretary of the Treasury, the Secretary of War, the Secretary of the Navy, the Surgeon General of the Army, the Surgeon

General of the Navy, the Surgeon General of the Public Health [and Marine-Hospital] Service, in conformity with the Act under which this Constitution is adopted, shall be ex-officio members of the Association.

Honorary Members

Sec. 7. The President of the United States, the senior general officer of the Army, and the senior flag officer of the Navy for the time being, shall be honorary members. Other persons who have rendered distinguished service to the Association, or who have otherwise attained distinction deserving of recognition by the Association, are eligible to honorary membership.

ARTICLE IV

GOVERNMENT OF THE ASSOCIATION

Advisory Board

SECTION 1. There shall be an Advisory Board consisting of the Secretary of the Treasury, the Secretary of War, the Secretary of the Navy, the Surgeon General of the Army, the Surgeon General of the Navy, the Surgeon General of the Public Health [and Marine-Hospital] Service and the President of the Association.

Officers

Sec. 2. The officers shall be a President and three Vice-Presidents, who shall be elected from and represent in regular rotation the Army, the Navy, the Public Health [and Marine-Hospital] Service, and the Organized Militia; a Secretary and a Treasurer; all of which officers shall hold their respective offices until their successors are elected and qualified.

Executive Council

Sec. 3. There shall be an Executive Council, to consist of the officers and six (6) members, who shall be appointed by the President each year.

Committees

Sec. 4. There shall be the following committees, to be appointed annually by the President, except as hereinafter specified.

A Literary Committee, to consist of seven (7) members—[four (4) members from the Organized Militia and one (1) each from the Army, Navy, and the Public Health and Marine-Hospital Service].

A Publication Committee, to consist of four (4) members, one of whom shall be the Secretary as ex-officio chairman.

A Necrology Committee, to consist of four (4) members.

A Committee of Arrangements for the next ensuing meeting, to consist of one (1) member, who shall be the chairman, with power to asso-

ciate with himself such other persons, members of the Association or not, as he may see fit.

A Nominating Committee, based upon a representative or one vote for each State, Territory, the Army, the Navy, and the Public Health [and Marine-Hospital] Service, and for every additional ten (10) members or major fraction thereof an extra representative or vote; said vote or votes to be cast by a member or members, present from each State, Territory, Army, Navy, and Public Health [and Marine-Hospital] Service, to be designed by the members present from each State, Territory, Army, Navy and Public Health [and Marine-Hospital] Service at the time of meeting.

A Committee on Legislation to consist of five members, one each from the Army, Navy and Public Health Service, and two members from the Organized Militia, to be nominated by the President and elected by the Association in annual meeting. (Adopted, Annual Meeting, Sept. 13-15, 1915.)

A Sinking Fund Committee to consist of the President, who shall be Chairman, the Treasurer, who shall act as secretary and custodian of the fund, and three members to be elected from the former Presidents of the Association, the latter to hold office for three years. Those first elected shall select by lot who shall go out at the end of the first, second and third year respectively, and each year thereafter one member shall be elected to the Committee at the annual meeting of the Association. Vacancies occurring in the interval may be temporarily filled by the Committee.

Boards of Award

Sec. 5. Boards of Award shall be appointed by the President for the consideration of such prize competitions as may from time to time be instituted by the Association. Membership in the Association shall not be required of members of the Boards of Award, which shall be selected in each instance from men conspicuous for knowledge of the subject of the competition.

Article V

SEALS, INSIGNIA AND ARMS

Seal

Section 1. The seal of the Association shall consist of a circle, one and three-eighths (1⅜) inches in diameter, charged with the cross of the insignia with the words, "Organized 1891, Incorporated by Congress 1903," within a circumferential band bearing the words, "Association of Military Surgeons, United States."

Insignia

Sec. 2. The insignia of the Association shall comprise (1) a Cross; (2) [a Button] **a Ribbon.**

(1) The Cross shall be of gold, the obverse enameled with red and bordered with gold, upon which shall be superimposed a white shield, inclosing a shield of the United States in its proper colors—red, white and blue with stars of gold—surrounded by the motto, "Omnia pro Patriæ Caritate;" the reverse, plain gold and bearing its number. Upon the reverse may also be engraved the name and address of the owner. The cross, suspended by a ribbon, consisting of two bands of crimson inclosing a band of white, may be worn by any member of the Association on ceremonial occasions, and shall be carried on the left breast—or at the collar, if the wearer be an officer of the Association.

[*The Button*]

[(2) The Button shall consist of a red enameled cross outlined in gold, upon a field of white enamel surrounded by a blue band, three-fourths (¾) of an inch in diameter, outlined on either side by circles of gold, and bearing the legend also in gold, "Omnia pro Patriæ Caritate." It may be worn by all members at their discretion in the upper left-hand button-hole of the civilian coat.]

The Ribbon

(2) The ribbon to be worn with civilian dress shall consist of a piece of ribbon 3/16 of an inch wide of the official colors of the Association, to be tied in the upper left hand button hole of the civilian coat and around the lapel with the knot to the rear. (Passed 1915 meeting.)

The Coat of Arms

Sec. 3. The Coat of Arms shall be as follows: Quarterly. First: Sanguine, a caduceus or; for Army. Second: Or, an oak leaf and acorn proper; for Navy. Third: Argent, a caduceus and an anchor in saltier azure; for Public Health [and Marine-Hospital] Service. Fourth: Azure and argent, the Union as borne on the American Flag; for the Organized Militia.

Surcharge—The Badge of the Association, proper.

Crest—An Eagle displayed, proper, bearing on breast a Geneva Cross.

ARTICLE VI

QUORUM

Thirty-five (35) members shall constitute a quorum for the transaction of business, but a less number may adjourn.

Article VII

AMENDMENTS

All amendments to this Constitution shall be proposed in writing at one annual meeting and voted on at the next. A three-fourths vote of all the members present at the annual meeting shall be necessary for adoption.

ARTICLE VIII

Sinking Fund

Such funds belonging to the Association as are not needed in current requirements shall be placed in the hands of a Committee to be known as the Sinking Fund Committee. The Sinking Fund shall be invested in Government or other bonds approved by the Committee, or deposited in an approved Trust Company until so invested and no money shall be withdrawn from this fund except upon a majority vote of the Sinking Fund Committee and of the Executive Council voting separately in session or by letter. When withdrawal is thus approved, it shall be made by an order on the Treasurer signed by the President of the Association. The custodian (Treasurer) of the fund shall be bonded in such sum as the Committee shall determine, and his accounts, and the securities and funds shall be audited annually and at such other times as the Committee requires.

BY-LAWS

Article I

ELECTION TO MEMBERSHIP

Active or Associate Membership

Section 1. Election to active or associate membership shall be by the Executive Council, to whom the Secretary shall refer all applications, together with such credentials as may be presented.

Honorary Membership

Sec. 2. Election to honorary membership shall be by a two-thirds vote of the Association, after the unanimous recommendation of the Executive Council.

Article II

Expulsion from Membership

Any member who may be dismissed from the service for conduct unbecoming an officer and a gentleman, **or who may be guilty of such conduct though then not a member of the service,** shall be expelled and debarred from any further rights or privileges when proper proof has been furnished.

ARTICLE III

Meetings

The Association shall meet annually, the time and place to be fixed at each meeting for the one ensuing. Special meetings may be called by the President at any time. At the annual meeting the President, Vice-Presidents and Treasurer shall be elected for the term of one year, the Executive Council and standing committees appointed, and the annual reports received.

ARTICLE IV

DUES AND FEES

Admission Fee

SECTION 1. The admission fee to be paid by active and associate members shall be five dollars ($5.00), which shall accompany the application for membership. **This shall include subscription to "The Military Surgeon" for one year.**

Annual Dues

Sec. 2. The annual dues shall be [two dollars ($2.00)] **one dollar ($1.00)**, due on the first of January of each year. No annual dues shall be required of new members for the remaining portion of the calendar year in which their admission fees have been paid. Delinquency for two years shall terminate membership, after due notice by the [Secretary (Adopted 1915 Annual Meeting)] Treasurer. **Provided that in the case of members who have resigned or have been dropped for non-payment of dues under Section 2 of this article, such members may be readmitted without payment of a second entrance fee and upon payment of delinquent dues.**

Members Exempt from Dues

Sec. 3. Honorary, Ex-Officio, and Life Members shall be exempt from the payment of dues.

Official Journal

Sec. 4. The annual subscription to the official journal by members of the Association shall be [two ($2.00)] **three ($3.00)** dollars, **payable in advance and the journal shall be stopped on expiration of unrenewed subscription.**

ARTICLE V

DUTIES OF THE ADVISORY BOARD

The Advisory Board shall meet at such times as the interests of the public service may demand. Meetings may be called by one or more

members of the Board and three members shall constitute a quorum. Any action taken by the Board shall be reported to the Association through the President of the Association.

Article VI

Duties of Officers

The President

Section 1. The president shall preside at all meetings, appoint all committees, unless otherwise provided for, approve all proper bills, and perform such other duties as are usually incumbent upon such an officer.

The Vice-Presidents

Sec. 2. The Vice-Presidents in order of seniority shall perform the duties of President in the absence or inability of that officer.

The Secretary

Sec. 3. The Secretary shall keep the **minutes of the meetings, the** records and archives of the Association; receive all applications for membership and refer them to the Executive Council; notify the Treasurer of the election of active and associate members; issue certificates of membership to active, associate, and honorary members on election, and to life members when advised by the Treasurer that the necessary fee has been paid; and shall hold office until his tenure is ter minated by resignation or death, or by the election of his successor after due and timely notice.

Ie shall be a member and ex-officio chairman of the Publication Committee.

He shall appoint an Assistant Secretary each year, and shall present an annual report.

He shall be editor of the official journal.

The Treasurer

Sec. 4. The Treasurer shall receive all moneys due the Association, collect all assessments, and pay all bills which have been properly approved, **except as provided in Article X.**

The accounts of the Treasurer shall be audited by a committee appointed for that purpose on or before the annual meeting, **and at such other times as the Executive Council shall require.** He shall present an annual report in which he shall state the number of members for each Service in the following classes: Life members; Active members in good standing; Active members delinquent; resigned; died, and dropped under Article IV, Sec. 2, of the By-laws. Said report shall show all receipts, disbursements and outstanding debts of the Association.

Members in good standing shall be those who have paid all their annual dues at date of the last audit of the Treasurer's account and none other shall be allowed to vote or be counted for votes in the annual or special meetings except by authority of the Executive Council, in each case where dues have been paid after that date. Adopted, 1915 Annual Meeting.

He shall be custodian of the Sinking Fund.

He shall execute such bond [of $2,000] as may be approved by the Executive Council for the faithful performance of his duties, the Association to bear the cost of this insurance.

Article VII

THE EXECUTIVE COUNCIL

Duties

Section 1. The Executive Council shall be charged with the conduct of the affairs of the Association during the intervals between the annual meetings, shall elect active and associate members, and perform such other duties as may be assigned to it by the Constitution and By-Laws or by vote of the Association at any stated or special meeting. **It shall temporarily fill all vacancies occurring among the officers of the Association between annual meetings.**

Conduct of Business

Sec. 2. The business of the Executive Council may be conducted by correspondence or at such meetings as may be called by the chairman upon his own initiative or at the request of any three members. **The Secretary shall keep a record of such correspondence and of the minutes of the meetings of the Council.**

Officers

Sec. 3. The President and the Secretary of the Association, respectively, shall be ex-officio chairman and secretary of the Executive Council.

Quorum

Sec. 4. Five members of the Executive Council **in meeting** shall constitute a quorum for the transaction of business. **In correspondence a majority of the whole Council shall govern.**

Article VIII

DUTIES OF COMMITTEES

Section 1. The Literary Committee shall outline the literary work for the annual meeting in advance, making the necessary arrangements for the reading and discussion of papers.

The Chairman shall be responsible for the program for the ensuing meeting.

The Committee shall assist the Publication Committee in the prompt publication of the Proceedings.

The Publication Committee

Sec. 2. The Publication Committee shall have charge of the publications of the Association.

It shall determine what portions of the proceedings are of sufficient general interest to be printed and decide upon the advisability of publishing the several papers presented at the annual meetings, and such other matter as may be of value to the Association.

[It shall prepare for publication, contract for printing and see through the press all the publications of the Association; but all contracts for printing must first have the approval of the President and the Treasurer.]

The Necrology Committee

Sec. 3. The Necrology Committee shall report to the Association, at each annual meeting, the deaths that have occurred during the preceding year among the members of the Association, with a suitable memoir in each case.

The Committee of Arrangements

Sec. 4. The Committee of Arrangements shall have charge of all local arrangements for the annual meetings of the Association.

The Nominating Committee

Sec. 5. The Nominating Committee shall, at the annual meeting, present a list of candidates for the various offices for the ensuing year.

The vote or votes of the Nonimating Committee shall be cast by a member or members present from each State or Territory, the Army, the Navy, and the Public Health [and Marine-Hospital] Service.

Article IX

duties of boards of award

Boards of Award shall be charged with the selection of the person or persons to whom prizes shall be awarded, in accordance with the regulations of such prize competitions as may, from time to time, be instituted, and shall report the results thereof at such time as may be designated by the Association.

ARTICLE X

The Journal of the Association

The Association shall publish a monthly journal to be known as "The Military Surgeon," in which shall be printed the proceedings of the annual meeting and such other matter as is determined upon by proper authorities. The cost of the journal shall be paid by an allotment of Association funds to be made on a budget submitted by the Editor and approved by the Executive Council.

The Secretary shall be ex-officio Editor of the journal and may appoint, with the approval of the Executive Council, such associate Editors and Collaborators as he finds necessary or desirable in conducting its publication.

He shall receive such monies accruing from subscribers, advertisers, and other sources pertaining to the journal as are sent to him, shall keep a business record of the same and deposit the money in a bank approved by the Executive Council, in the name of The Association of Military Surgeons of the United States, subject to his order.

He shall pay such bills as are due in connection with the journal, which have been approved by the President, or an officer of the Association designated by him, and shall render a monthly account through the President to the Treasurer with his check for any unexpended balance remaining to his account at the end of each month.

The Editor shall be bonded in amount determined by the Executive Council and shall submit a report at the annual meeting of the Association, with a statement of his accounts duly audited by a certified accountant, to be designated by the Executive Council, and such other reports as may be called for by the Council.

ARTICLE XI

Amendments

All proposed amendments to these by-laws must be forwarded to the Secretary, who will present them to the Executive Council at least three months before the next annual meeting. The proposed amendments and views of the Council shall be published in the journal of the Association not later than one month before the annual meeting, at which meeting they may be adopted by a three-fourths vote of all the members present.

ARTICLE XII

Order of Business

1. **Reading of records of previous meeting.**
2. **Appointment of Committees.**
3. **Report of Executive Council.**
4. **Report of Secretary**
5. **Report of Treasurer.**
6. **Report of Editor.**
7. **Reports of Standing Committees.**
8. **Reports of Special Committees.**
9. **Unfinished Business.**
10. **New Business.**
11. **Literary and Social Program.**
12. **Election of Officers.**
13. **Installation of New Officers.**
14. **Reports of Committees.**
15. **Incidental Business.**
16. **Adjournment.**

The parliamentary rules governing in the Congress of the United States shall be the standard of this Association.

The proposed Amendments to the Constitution must lie over until the next annual meeting for action. The following, submitted at the Twenty-fourth Annual Meeting, were adopted:

To include in Article III, Section 3, as the sixth classification: "Acting Assistant Surgeon of the United States Army, Navy and Public Health Service."

Article V, Section 2, paragraph 2: "The insignia to be worn with civilian dress shall consist of a piece of ribbon $^{3}/_{16}$ of an inch wide of the official colors of the Association, to be tied in the upper left-hand buttonhole of the civilian coat and around the lapel with the knot to the rear."

No action was taken on the proposed amendments to the by-laws.

The Chair then appointed the following committees:

Resolutions Committee.—Brig. Gen. J. D. Griffith, M. C., Mo. N. G., ret.; Lieut. Col. Wm. N. Bispham, M. C., U. S. A.; Med. Dir. G. A. Lung, U. S. N.; Asst. Surg. Genl. Wm. C. Rucker, U. S. P. H. S.; Maj. V. C. Vaughan, M. O. R. C., U. S. A.

Nominating Committee.—Col. Henry Page, M. C., U. S. A.; Med. Insp. F. E. McCullough, U. S. N.; Surg. J. O. Cobb, U. S. P. H. S.; Lieut. Col. Jacob Frank, M. C., Ill. N. G.

Auditing Committee.—Brig. Gen. S. C. Stanton, M. C., Ills. N. G., ret.; Med. Inspt. F. E. McCullough, U. S. N.; Surg. J. O. Cobb, U. S. P. H. S.

The morning session closed with an address by Maj. Victor C. Vaughan, M. O. R. C., U. S. A., on "Coöperation of the Civil Medical Profession with the Medical Services of the Government in Time of War."

The second session was called to order by the president at 1 p. m. and the members listened to an interesting symposium on "How Medical Military Services of the Government May Best Coöperate in Time of War," presented by Col. Louis A. LaGarde for the Army, P. A. Surg. W. E. Eaton for the Navy, and Asst. Surg. Gen. Wm. C. Rucker for the Public Health Service. Owing to the absence of Dr. Eaton his paper was read by Med. Insp. McCullough, U. S. N.

The symposium was followed by an address by Maj. Joseph C. Bloodgood, M. O. R. C., U. S. A., and Colonel Goodwin spoke on "The Practical Medical Military Lessons of the War." The session was then adjourned to witness a parade and review of the command.

Just what this military function means would have been very hard for many of us to vizualize a few months ago. Thirty-five hundred sanitary troops in line, of which 1,000 were medical officers, most of whom a short time since were practicing our profession amid the peaceful haunts of civil life. Why sanitary troops, and why the camp of instruction? Because, thank God! the people have at last come to realize that sanitary troops are really "troops," and that medical officers must be trained as soldiers if they are to efficiently perform their duties.

It goes without saying that the review and parade were admirably done, reflecting credit upon the commanding officer, his staff of instructors and the body of student officers.

Then came the barbecue—who can describe the barbecue? No food conservation there, but none wasted, as it all went into calories to keep up the mv^2. What Mr. Hoover would say about the beeves, the sheep, the goats (were there goats?), the porkers, the pumpkin pies and the mulled cider and eggs, we don't know, nor do we care. They were just bully.

Later that night Colonel Dercle gave an illustrated lecture on "Medical Services at the Front." Then "taps," after a grand day.

The fourth session, Tuesday morning, October 9, was called to order at 8 o'clock. Think of it, ye sybarites! 8 o'clock, and this is an hour when soldiers find the day well advanced.

The following addresses were presented: "The general Aspect of the War," by Col. T. H. Goodwin, R. A. M. C.; "Plastic Surgery," by Surgeon Bainbridge, U. S. N.; "Transportation of Wounded on the Western Front," by Capt. J. Gilmour, R. A. M. C.; and "Trench Warfare," by Lieut. Henry Haye, of the French Army.

Following these the Nominating Committee presented its report, submitting the names for:

President: Med. Director Geo. A. Lung, U. S. N., U. S. Naval Hospital, Brooklyn, N. Y.

First Vice-President: Lieut. Col. Henry Allers, M. C., N. J. N. G., Harrison, N. J.

Second Vice-President: Brig. Gen. Henry P. Birmingham, M. C., N. A., Washington, D. C. (at the front).

Third Vice-President: Asst. Surg. Gen. J. W. Kerr, U. S. P. H. S., Washington, D. C.

Treasurer: Asst. Surg. Gen. Wm. Colby Rucker, U. S. P. H. S., Washington, D. C.

Under the Constitution the office of secretary is permanent.

The report was accepted and the secretary directed to deposit a ballot for the nominees, which he did, whereupon the president declared them duly elected.

The Auditing Committee submitted the following report:

October 8, 1917.

The Auditing Committee desires to report that it has examined the books of the treasurer and treasurer *ad interim* and finds them correct; and that the amount of balance as shown therein agrees with the bank balance.

The committee commends the care and painstaking work of the treasurer, Maj. J. H. Ullrich, M. C., Md. N. G., and of the treasurer *ad interim*, Assistant Surg. Gen. W. C. Rucker, and recommends that the system of book-keeping at present in force be continued and extended.

Samuel C. Stanton,
Major, M. C., U. S. R.
F. E. McCullough,
Medical Inspector, U. S. N.
J. O. Cobb,
Surgeon, U. S. P. H. S.

On motion this report was adopted.

Colonel Persons, commanding the camp at Allentown, Pa., gave an interesting résumé of the work at that camp, which is devoted to the organization and instruction of medical transport personnel, and the collection of transport matériel.

Surg. J. O. Cobb, U. S. P. H. S., described the plan and scope of his health educational campaign, in connection with which Surgeon General Blue invited the Association to visit the Railroad Sanitary Car, which

was in charge of Dr. Cobb and was standing on a nearby track; whereupon the session adjourned.

The afternoon exercises on Tuesday consisted in field demonstrations of Medical Department activities, interestingly and effectively presented. Much might be said here of the value of this instruction, which this Association has been such a persistent and important factor in promoting, which was regarded with suspicion in the early days of the organization but which today is accepted without question, indeed is demanded as a *sine qua non*. Suffice it, that this is a part of our mission already accomplished.

At the sixth session, Tuesday night, Colonel Dercle completed his interesting story of the "Medical Service on the Western Front," and Maj. Thomas H. Salmon, M. O. R. C., U. S. A., gave an illustrated lecture on "War Neuroses." Colonel Frank's paper, "An Efficient State Medical Department," was read by title as unfortunately the Colonel was called back to Chicago.

Then followed bonfires and singing, a jolly time "tenting on the old camp ground."

The final session was called to order at 8.00 a. m., Wednesday, October 10, the president in the chair.

General Blue, addressing Medical Director Lung, said:

"In keeping with the practice of the past, it now becomes my pleasant duty to present to you our new president, Medical Director George A. Lung, U. S. Navy, who will preside at the final session. Dr. Lung needs no lengthy introduction at my hands."

Dr. Lung, replying, said: "This is not the time nor are the circumstances favorable for me to make you a formal address. It would be superfluous for me to express in measured terms my sincere gratitude for the honor the Association has conferred upon me, and it is obvious to you all that I feel profoundly the responsibility that it has put upon me. In the history of this Association there never has been a time when it signified so much as it does today. It has assumed proportions and magnitudes that have gone beyond all that any of us dreamed of, and therefore the responsibility that devolves upon the officers for the maintenance of the things that concern them and the Association is all the greater. This meeting has been unique and unusual in that it has been in the environment of a military encampment, we have had an audience of a larger proportion of medical officers than ever before, and the value of the meeting has been enhanced by the fortunate presence of four very gallant men who come from the front. What I and my associate officers may accomplish will depend largely on what you do, for the success of the Association is what its individual members strive to accomplish. Gentlemen, I thank you for this honor."

Medical Director Lung then took the chair.

The Committee on Resolutions submitted the following:

"*Resolved*, that Col. Percy M. Ashburn be tendered the gratitude of the Association for the efficient way in which he has administered the affairs of the Committee of Arrangements.

"*Resolved*, that the thanks of the Association be expressed to the, chairman of the Barbecue Committee for the bountiful feast which he served us, and for the hospitable and magnificent way in which the entire affair was carried out.

"*Resolved*, that the Association express to the commanding officer, Fort Benjamin Harrison, Ind., Colonel Root, U. S. A., its sincere thanks for the many favors, at his hands, it has enjoyed during its stay here; and finally be it

"*Resolved*, that the Association express to the Prestolite Company, which has furnished lights without charge, its appreciative acknowledgments."

The report of the committee was accepted and the resolutions adopted as submitted.

Dr. Rucker addressed the chair as follows: "Pending final action on the proposed amendments to the constitution at the next annual meeting I wish to present the following resolutions:

"*Resolved*, that the idea of the proposed amendment under the title 'Sinking Fund' be given force immediately by resolution of this meeting, and the Executive Council be directed to appoint a Savings Committee to consist of the president, treasurer and three former presidents to hold office until the next meeting of the Association; to transfer such funds as in its judgment shall not be needed in the current work of the Association, and of which the treasurer shall be custodian, to the savings fund and invest them as proposed in the said amendment. That, when so transferred, nothing shall be drawn from this savings fund except by a majority vote of the Savings Committee and the Executive Council voting separately.

"*Resolved*, that vacancies occurring between meetings, among officers of the Association, may be temporarily filled by the Executive Council: Provided, that when the Executive Council and Savings Committee vote by correspondence a majority of the whole council and committee shall decide."

These resolutions were duly seconded, voted upon, and declared by the Chair unanimously carried.

Maj. J. O. S. Skinner, U. S. A., ret., presented through Dr. Rucker the following resolution approved by the Committee on Resolutions.

"*Resolved*, that it is the sense of The Association of Military Surgeons

of the United States, in its annual meeting assembled, at the training camp for medical officers, Fort Benjamin Harrison, Ind., October 8-10, 1917, that it would be commendable, wise and proper to have mobilized, by competent authority, such medical service of the United States as is not now, or may not become, during the present war, utilized by the United States Government for military, naval or public health service, at home or abroad; and that such mobilized medical service be so organized and administered as will insure medical service, free of charge, during the war, to the families or dependants of such officers, soldiers, sailors, or members of the Public Health Service engaged in active military, naval, or public health service, as may require such mobilized medical services and are not, or may not, be otherwise provided for in this respect by the United States Government, without charge to the said families or dependents of said officers, soldiers, sailors, or members of the Public Health Service."

Upon motion that this resolution expresses the opinion of the Association, duly seconded, it was carried.

The secretary submitted a letter from Col. E. E. Persons, Army Ambulance Service, proposing a further amendment to Article III, Section 5, paragraph 5, making it to read: "Officers of the Dental, Veterinary and Sanitary Corps and of the Army Ambulance Service."

Dr. Rucker being recognized by the Chair, said:

"Mr. President, at the present time there are only two branches of the Association of Military Surgeons who have authority to display upon their uniforms the insignia of this Association, the U. S. Navy and the Public Health Service. The Army has not been permitted to do this, and I would invite the attention of the President and members of the Association to the following excerpt from the charter which was granted us by the U. S. Congress on the 30th of January, 1903: 'Sec. 3. That the said association is authorized to hold real and personal estate in the United States, so far only as may be necessary to its lawful ends, to an amount not exceeding one hundred thousand dollars, and may adopt a constitution and make by-laws not inconsistent with law, and may adopt a seal and an insignia which may be worn by its members.' I would therefore move you, sir, that the Association request the president of the Association to take this matter up with the Secretary of War in person and invite his attention to the legal rights of this body, requesting that an order be issued to permit of the wearing of the insignia." This motion was duly carried.

Dr. Rucker: I have another resolution I would like to present: "*Resolved*, that the Association of Military Surgeons unanimously tender to Col. John Van R. Hoff its most heartfelt thanks for his most effi-

cient handling of the difficult and arduous duties of Editor of THE MILITARY SURGEON, a duty that he has discharged without hope of reward and the fulfilment of which has been greatly to the advantage and instruction of every individual member of the Association." This resolution was duly seconded and carried unanimously.

Colonel Briggs, M. C., N. Y. N. G., ret., former president of the Association and beloved by all its members, briefly addressed the meeting, after which "The Retreat from Mons," by Col. T. H. Goodwin, R. A. M. C., held the interested attention of his audience.

The following telegram was read: "Rochester, Minn., 7-8, Surgeon General Rupert Blue, Fort Harrison, Indianapolis, Ind. I am sorry previous engagement prevents my attendance at the meeting of Military Surgeons, which is destined to be one of the greatest medical associations in this country. I hope this meeting will be a most successful one.

"CHARLES H. MAYO,
"*President American Medical Association.*"

The President: This, gentlemen, closes the program of this, the Twenty-fifth Annual Meeting of the Association of Military Surgeons. Owing to the condition of the times and the impossibility of telling what the conditions will be next summer, the date and place of the next annual meeting will be left with the Executive Council. A motion for adjournment is in order.

Upon motion duly made, seconded and carried the president declared the meeting adjourned *sine die*.

RECENTLY ELECTED MEMBERS

The following named officers were duly elected to membership in the Association of Military Surgeons of the United States at the meetings of the Executive Council held September 25 and October 7, 1917:

Medical Corps, U. S. Army

Major

Samuel J. Turnbull

First Lieutenants

Francis E. Gessner
Thom. McS. Barrett

U. S. Navy

Assistant Surgeons

Donald R. Davidson
Robert W. Belknap
Samuel Segal, Jr.

Asst. Surgeons—cont'd.

Walter J. Pennell
Jacob S. Rosenthal

National Guards

Major

Robert C. Bourland

First Lieutenants

Albert A. Hornor
Herbert L. Johnson
Peter G. McKenna

1st Lieuts—concl'd.

Reuel A. Piene
James Y. Rodger
Edward B. Sheehan
Conrad Wesselhoeft
Charlton Jay
George S. Martin
Henry H. Hibsman
Chas. M. Robilliard
William T. May
Frank E. Shineer
Mark B. Holzman

Medical Officers' Reserve Corps

Majors

John Auer
E. E. Brackett
A. G. Brenezer, Jr.
Vilray P. Blair
John F. Binnie
Pearce Bailey
Bert W Caldwell
Thomas E. Chandler
James F. Clarke

Majors—Cont'd.

Colin R. Clark
Frederick J. Combe
Harlow G. Farmer
Otho Fiedler
George E. Johnston
Theodore C. Janeway
Maurice H. Krebs
Preston S. Kellogg
William C. Lyle
Warfield T. Longcope
William H. G. Logan
J. H. McHenry
Harris P. Mosher
William F. Snow
David Silver
Victor C. Vaughan
Charles S. Venable
Arthur Wells Yale

Captains

Alfred W. Armstrong
Clark L. Abbott
Francis W. Anderson
Theodore B. Appel
Chas. S. Bryant
Frederick H. Bailey
David Bovaird
William R. Bethea
James Brew, Jr.
Timothy L. Barber
Ferdinand L. Benz
Ralph E. Balch
Frederick P. Bender
James C. Butler
Albert E. Brown
James M. Bannister
Horace Binney
B. F. Cunningham
Thomas K. Conrad
Charles E. Congdon
Howard T. Carriel
William G. Crumley
Howard D. Collins
Alex R. Craig
Robert L. Crockett
Paul Christmaun
C. T. Chamberlain
H. C. deV. Cornwell
Henry S. Cole

Captains—cont'd.

Ira H. Dillon
Frank D. Dickson
William J. Douglas
Gustaf R. Egeland
William J. Egloff
Geo. V. Fiske
A. M. Foster
Henry M. Field
Albert H. Freeman
James T. Flanagan
Charles M. Gower
Michael E. Gardner
George L. Guthrie
Edward C. Greene
Adolph T. Gilhus
George H. Garrett
Robert T. Gillmore
J. M. A. Gravelle
Herbert H. Haynes
Emile C. Houle
Edward McI. Haley
John A. Heatly
Willard H. Hutchings
John H. Harvey
Louis Huoten
John F. Herrick
Robt. M. Howard
Henry H. Healey
Geo. W. Hawley
Robert H. Ivy
Benj. R. Johnson
Chas. G. B. Klophel
Edwin B. Kenner
Geo. W. Lochner
Wm. T. Lum
Lorenzo F. Luckie
James C. Logan
W. H. Lawrence, Jr.
E. Martin Larson
John B. Lowman
Geo. E. Lewis
Jesse W. Lea
Frank M. Lett
Edward J. McCague
Francis W. McGuire
C. B. McCulloch
Lewis H. McKinnie
Bernard S. Moore
John W. Moore

Captains—cont'd.

Robt. D. Mussey
William B. Moon
James E. Maloney
W. A. Morrison
Geo. H. Musselman
Benj. J. Marshall
Edward C. Mitchell
Howard C. Naffziger
Edward E. Neaxey
Erskine P. Odeneal
H. Winnett Orr
Alf. J. Ostheineer
John M. O'Farrell
Curtis D. Pillsbury
James D. Pilcher
Albert S. Parker
John T. Price
Samuel B. Pulliam
Eugene E. Palmone
Carlisle Reed
Alpha E. Rockey
Robert C. Rind
H. E. Ruggles
Herbert E. Randall
William B. Ray
Robert Burns, Jr.
William B. Reid
Wallace Ralston
Alexander C. Soper, Jr.
Ernst H. Stark
Henry Stiek
Hugh B. Sprague
Alonzo DeM. Snyder
Samuel W. Shapira
M. L. Stockton
Daniel B. Stidworthy
Philip H. Stewart
Henry L. Schelling
Charles T. Sturgeon
Arthur F. Stotts
John M. Taylor
Clarence Van Epps
John B. Thompson
Frederick C. Test
John N. T. Tester
Archibald W. Taves
Frank A. Walters
Harry G. Willard
Jefferson Woolsey

Captains—cont'd.

Herbert Walker
Russell M. Wilder
Harry B. Williams
Alfred P. Webb
P.H.vonZierolshofen

First Lieutenants

Wm. A. Allen
Geo. F. Aycock
Albert A. Axley
Oscar Anderson
Robert W. Ashley
Serge Androp
Edward H. Atkin
Daniel M. Adams
Russell B. Armor
Maurice L. Allen
John F. W. Allen
Louis deK. Belden
William P. Bernard
Diederick G. Brunjes
John B. Brickell
Sidney P. Brown
Geo. A. Becker
Robert O. Blood
John E. Belding
Otis H. Bradley
Arthur A. Bird
Frank J. Broschart
Charles H. Brownlee
Gary L. Boykin
John G. Backstrom
Clyde McK. Beck
Walter McBeth
Bernard Barrow
Samuel Brown
R. G. Bazell
Harry L. Bridgman
Merle Bonne
Grover A. Beckett
Robert E. B. Bledsoe
Charles E. Brenn
Harry S. Berman
Norman P. Bentley
John M. Bearden
Paul E. Bain
Stephen C. Bradley
Archer C. Bush
Geo. J. Brand
Peter J. Barone

1st Lieutenants–cont'd.

Geo. W. Bishop
Eleazar R. Bowie
Dolor I. Beaupre
Bennett A. Brande
Charles D. Busby
Karl T. Brown
James A. Boyer
Albert S. Barr
Walter S. Bebb
Geo. F. Calver
Montie C. Comer
John R. Callaway
Elbert E. Cone
Howard W. Cleasby
Lambert B. Coblentz
Geo. R. Curl
Harry E. Canfield
Herman L. Crary
Ira B. Chadwick
James A. Coleman
Harry M. Coleman
Geo. W. Cusick
Sanford C. Colley
John A. Crabb
Osmer L. Callahan
Arthur B. Connor
Joseph Don Collins
Thos. H. Chattle
Glenn B. Carpenter
Peter R. Carelos
French H. Craddock
Geo. S. Cunningham
William L. Clark
Milton B. Coffman
Clinton C. Cady
Fern M. Cole
Tate B. Collins
Corwin S. Cornell
Eugene Cary
John W. V. Clift
Novel W. Campbell
James W. Crum
Nicholas B. Cannady
Charles J. Carden
Roland R. Culbertson
Guy M. Claflin
Everett P. Coleman
John L. Conover
Clarence W. Chapin

1st Lieutenants–cont'd

Vancleft Decker
Rudolph Duenuog
Wade Doster
Clarence H. Doty
Harry Deibel
Albert H. Damon
Joseph F. Dolphin
Reaves W. DeCrow
Victor d'Ercole
James W. Duckworth
M. F. Daubenhayer
Charles J. Davis
James R. Earle
Dan H. Eaton
James L. Evans
Leslie H. Ewing
William P. Ellis
Walter L. Ellis
Henry Ehlers
Samuel R. Evans
Roscoe C. Eaton
Reuben J. Elliott
Thomson Edwards
Gerald D. France
Fred. H. Ferguson
Homer J. Flinn
Gustav A. Floreth
Giordano B. Fliedner
Leo. E. Froomess
Charles M. Freeman
A. W. Foertmeyer
Percy H. Finch
Wade H. Fortner
Morris Finkelberg
James H. Fiscus
Mannie A. Fort
Eugene A. Frechet
Cyril G. Field
Mont R. Farrar
Morton W. Fraser
C. P. Farnsworth
Claude E. Frazier
Winfield S. Faulds
Harry Fried
Malcolm B. Fyfe
Geo. A. Green
David E. Griffiths
Cecil Garrenton
Harold E. Gillett

1st Lieutenants–cont'd

Nathan D. Garnsey
Benjamin F. Gibson
Harold A. Goodrich
Lewell T. Genning
Raymond C. Gillogly
Anthony Gruessner
Abraham J. Gordon
Hiram Gallagher
John A. Grafft
Walter P. Guy
H. E. Griswold
William F. Grayson
James F. Gratton
Alonzo P. Gearhart
Edward M. Gans
James K. M. Guthrie
Lee McC. Goodman
Jerome T. Gardner
Charles M. Gray
William D. Gates
Antony J. Greco
Burt F. Green
Wilber A. Griffith
Grant J. Grady
Jos. A. Hurley
Sandor Horwitz
Charles H. Haberer
Walter L. Henderson
Philip F. Herod
W. J. Hosford
Benj. C. Hamilton
Robert E. Hearn
A. J. Hertel
Reuben C. Hanchett
Claire D. Hopper
Henry Horn
Allen G. Heard
Leon B. Harris
Archie S. Horn
Walter B. Holton
James M. Hayes
John H. Humes
Frederick E. Hudson
Charles E. Herriot
Mayro O. Hedge
Geo. L. Haefele
Charles E. Hawke
Edward L. Hallinan
Emory S. Hall

1st Lieutenants–cont'd

H. K. Richardson
Frank A. Hubbard
Louis K. Henschel
Sam Hardeman
Edgar R. Hiatt
Daniel M. Hoyt
Herschel G. Harris
Burton A. Hall
James F. Hilgenberg
Edward J. Howland
Chas. L. Harding
Arden N. Howe
Isidore D. Haskell
James T. Harrington
Chas. McC. Iseman
Herbert W. Insley
Arthur L. Izlar
Ralph P. Jones
Dennis B. Jarrell
John F. Jenkins
Norburne B. Jenkins
Clyde W. Jump
Frank H. Jordan
Charles E. Jenkins
Levy S. Johnson
John S. Jenkins
William H. Jenks
Jos. M. Kenworthy
William L. Kenney
Leon M. Kysor
Henry S. Keyes
William C. Kentner
Harry L. Kempen
Chas. H. Kirk
Forest C. Kracaw
William A. Kniesel
Clarence H. Ketterer
Matthew Karasek
Harry Knott
John A. Konzelman
Saml. C. Leonhardt
William H. Lyon
Leon S. Lippincott
Frank S. Lower
Thomas M. Leahy
Samuel E. Lyon
Geo. M. Logan
Charles E. Lehmberg
Jesse H. Lande

1st Lieutenants–cont'd

G. A. Landmann
Geo. H. Lang
Oscar N. Lightner
John W. Lyons
Augustine R. Langier
Joseph D. Lyle
Frederic H. Leavitt
Douglas A. Lehman
Louis Levy
Guy A. Longhake
L. Dudley Long
Clarence E. Mullens
Bradford Massey
James F. Masser
Nelson A. Myll
Brown S. McClintic
Arthur J. McCarey
Arthur J. McCracken
Walter H. Mytinger
John W. McGuire
Samuel J. Marks
M. B. McConigle
Arthur E. McCarthy
Joseph M. Moss
John E. McKillop
J. W. McPheeters
James McFadyen
Ralph McReynolds
Geo. S. Murphy
Frank F. Marshall
Frank C. Maguire
Guy M. McLeon
E. C. J. Miller
Geo. Maresh
Thomas W. Moffitt
John C. Maxson
Walter F. Macklin
Alex. M. Macaulay
Virginius Minewini
John A. Maness
John A. Millet
Chas. N. Meriwether
Harvey M. Mayer
Edwin N. Maercklin
Solomon C. Mish
Elliott H. Metcalf
Orville R. Miller
C. C. Montgomery
J. C. MacDougall

1st Lieutenants–cont'd

James O. Matthis
Eric A. McVey
Wm. W. Moir
John Jay Moore
Edwin R. F. Murphy
Joseph J. Meyer
Lot. D. Mabie
Wm. L. Meng
Geo. L. Marshall
Edgar H. Myers
Theo. M. Wiersen
Ed. N. Mendenhall
Garnett P. Morison
Frank S. Matlack
William E. Mercer
Richard J. Miller
Milton O. Nyberg
Robert A. Noble
Arthur R. Nash
DeWitt B. Nettleton
Herbert P. Nottage
Thomas G. Nelan
Frank E. Nagel
Harry C. Nichols
Martin A. O'Brien
Colin C. Owen
William Ostrow
Harry Olin
John W. Olson
John D. O'Brien
Elmer D. Osman
Adcai H. Oliver
Augustus M. O'Brien
Loran E. Orr
S. E. G. Pedigo
Ralph E. Powers
Frank S. Pratt
Fred P. Patton
Arthur S. Pendleton
Henry E. Parnell
William T. Pyle
John L. Pepper
Clermont E. Park
Harry L. Pelle
William H. Phillips
George W. Potts
Charles Phillips
George F. Puffett
John E. Paulson

1st Lieutenants–cont'd

Benj. F. Pence
Isadore L. Pauelek
Bascom H. Palmer
John Pellarin
H. Paul Preston
Armstrong C. Pratt
Burton E. Paul
Charles P. Roach
John E. Rueth
William L. Ross
John L. Riley
Howard P. Rankin
Wilton H. Robinson
William H. Rupert
Fred. E. Redman
Samuel W. Reeves
L. Crawford Russell
Harry Rogers
William D. Rowland
Howard R. Rorig
William E. Ray
A. M. Rothrock
Dunbar Roy
Albert W. Rye
Daniel R. Robert
Wallace Rose
George B. Reitz
Conner O. Reed
William J. Rideout
Hobart C. Ruadick
Harry Rubinstein
Walter C. Roller
William A. Smith
Homes G. Scranton
Orlando F. Scott
Oscar Spier
Michel Saliba
Marcus G. Spingarn
Robert Spear
Carl H. Schnaer
H. W. Steelhammer
Sydney S. Schochet
Fitzhugh P. Salley
Louis B. Sachs
Samuel Sullivan
John E. Soper
Paul R. E. Sheppard
George H. Shaw
Egbert T. Scott

1st Lieutenants–cont'd

Richard H. Simmons
Otto J. Seifert
Donald B. Sinclair
Kyle B. Steele
Henry MacV. Smith
Bartlett L. Shellhorn
Harry J. Schott
Paul R. Siberts
Joseph R. Shelton
James M. Shields
Roy L. Stackpole
William N. Shapiro
Myran W. Snell
P. F. Sappington
Thomas R. Scaly
Iver Stoland
Albert L. Solomon
Eugene B. Sharp
George K. Strode
Daniel E. Stedem
Gardner A. Sayres
William F. Smith
John G. Striegel
James B. Stanford
Manton L. Shelby
John N. Sherman
Newton A. Sechorn
Robert J. Shyers
Jos. T. Slonimsky
Cliffort J. Spruce
Robert E. Spinks
Julio R. Soltero
Benj. J. Slater
Henry B. Siglar
Chester A. Stayton
Frederick H. Spencer
V. H. de Somoskeoy
D. DaCosta Shira
H. M. Southworth
Allen W. Sinjer
Robert B. Sweet
Leopold Shumacker
Pierre A. Steele
John Speese
August M. Sartorius
Harry W. Shaw
Normal E. Titus
Geo. A. Taukersley
F. Clayton Thiede

1st Licutenants–cont'd

Samuel L. Thorpe
John B. Thomes
Frank C. Todd
James Thornton
John H. Timberman
Edgar S. Turner
Geo. E. P. Truitt
Charles W. Tedrowe
Carl Voss
Guy B. Van Sandt
Henry R. Viets
Bernard D. Verret
W. W. Van Dolsen
John M. Whitford
Earl L. Waite
A. B. Weathersbee
Edwin F. Wakefield
Horace J. Whitacre
Arthur R. Woods
John B. Warden
Edwin D. Watkins
Colin R. Wierick
Harry J. Willey
B. T. Williamson
Leonard W. Weaver
Geo. W. Wilhite
Edward C. Wittwer
Charles H. Wilson
Clyde E. Watson
Ernest E. White
William J. Whitaker
L. H. Wheeler
Joel A. Wilkinson
Geo. S. Woodard
Glover B. Wilcox
Woodye A. Winter
William J. Whitefort
James W. Wheeler
Leonard S. Wagar
Henry P. Webb
Karl F. E. Wegener
Joseph A. L. Wolf
William P. Worrick
Max. K. Willoughby
Mortimer Warren
Abraham R. Yoosuf
Henry S. Zimmerman
Al. S. Zimmerman
Joshua F. Abel

1st Lieutenants–cont'd

Frank M. Barker
Albert E. Barber
Charles Wolf
Benj. B. Rowley
Isadore J. Goodman
Watson W. Gailey
Charles P. Haller
Gustavus W. Moll
Malford W. Thewlice

Medical Officers Reserve Corps

Majors

Edward L. Keyes, Jr.
C. Frothingham
Winford H. Smith

Captains

Maurice Asher
Edgar S. Bullis
Charles Bagley, Jr.
Erastus Corning
Joseph F. Grant
Martin Kollig
Snyder J. H. Louther
William J. Lyman
Harlan W. Long
William G. Lee
Charles J. Leverty
Herbert A. Makinson
Robert H. McLeod
Stephen C. McCoy
Louis I. Mason
Edwin W. Morse
Philip S. Potter
Alfred P. Roope
William F. Scott
James R. Swanick
Homer Sylvester
Elijah W. Tidd
A. C. Thiolliere
Emil Windmueller
Herbert L. Celler
Willis S. Cobb
Frank C. Robinson
George R. Osborn

First Lieutenants

Harley L. Acuff
Matthew C. Baines

1st Lieutenants–cont'd

Ivan E. Brenner
John W. Ballard
Charles C. Carr
Ralph G. Cressman
John S. C. Chapman
Ralph E. Curti
Daniel R. Chase
James G. Dermelly
Geo. H. Dalton
Roswell F. Foster
John W. Frost
Rush F. Farley
Patrick H. Fleming
Frank E. Fox
Leon Felderman
Wilmer E. Griffith
George R. Goering
Edwin Henes, Jr.
Philip Herrin
Halle L. Hewetson
Henry W. Haynes
Daniel C. Hankey
Robert R. Hampton
David M. Hassman
Jesse L. Hall
Lewis S. Harvey
William A. Heckard
Edward R. Hunter
Robert H. Jacobs
Clyde T. Knuckey
Arnold B. Kauffman
Ellis D. Kackley
Ira D. Kelsheimer
Ebner E. Lynch
Leo C. LeClar
R. O. Leavenworth
William L. Layport
Sam M. Myers
Thos. D. McKinney
George W. Manning
Charles H. May
Harold E. Nicholson
Joseph A. Nowicke
John B. Overall
Walter J. Otis
Louis E. Poole
Martin H. Post
John C. Phillips
Francis E. Reed

1st Lieutenants–cont'd

Herbert A. Roberts
Herbert D. Ryman
Fred T. Rucker
William A. Ricard
Arthur S. Rosenfeld
George R. Reay
James S. Skaggs
Oliver B. Simon
Robert R. Sateler
Millard F. J. Smith
Frederick W. Sell
Irving W. Steiner
Marion L. Turney
S. Paul Tharp
Anthony J. Vadala
Oscar C. West
Herbert P. Walker
Martin D. Westley
Leon A. Williams
Thomas Wilson
Ralph L. White
Jay Thomas Wood
Donald K. Woods
Arthur L. Wallace
Forrest J. Young
Albert F. Adams
Muir Bradburn
Arthur Hartley
Alexander Josewich
Percy S. Rawls
Ardus C. Thompson
Hall G. Van Vlach
David C. Williams

U. S. Navy

Assistant Surgeon

Joseph W. White

U. S. Public Health Service

Assistant Surgeon

Robert B. Acker

U. S. Army

First Lieutenant

C. D. Allen

National Guards

First Lieutenant

Leon H. Cornwall

Medical Officers Reserve Corps

Majors

Fred W. Bailey
Eugene Buehler
David B. Downing
William H. Goodwin
Bernays Kennedy
Chas. D Lockwood
Sidney Strauss
George B. Wallace

Captains

Lester Adams
James P. Aylen
C. L. Bjerring
Thomas E. Cherry
J. F. Cooper
Ralph A. Fenton
Edward W. Ford
John H. Gilpin
Augustin de G. Green
Adolphus W. Guest
Malcolm E. House
William M. Hunt
William D Hunter
Frank F. Hutchins
William A. Jackson
Owen Kenan
Charles E Long
Thos. E McCaughan
John E. Metcalf
Robt. H. Monahan
O. L. Norris
William R. Ohler
Albin M Painter
John L. Phythian
Alvin Powell
Walter W. Rosser
Scott C. Runnels
Henry G. G Schmidt
John D. Shipman

First Lieutenants

Isaac Alexander
Ray M. Alexander
Clyde F. Baccus
Ulysses M Bachman
William O. Benjamin
Jerome F. Berry
Paul E. Betowski

1st Lieutenants—cont'd

James W. Beveridge
Frederick A. Blesse
George W. Boner
Albert Boman
William E. Boyce
Elisha W. Brown
Paul C. Carson
Willis H. Corson
John R Crum
Rufus J. Danner
Pinkney L. Davis
Benjamin H Dike
William B. Doherty
Jesse C. Edwards
William Engel
Nathaniel W. Faxon
Frank L. Field
Francis M Fitts
George B. Fletcher
Arthur J. Fomard
Charles M Fox
Wilmer P. Frazier
R. C. Fullenweider
Orion A. Grantham
John G. Guenther
John R. Hall
Frederic Hagler
Howard R. Heckert
Raymond E. Hillmer
Joseph C. Horan
Joseph W. Hooper
Henley H. Hubbard
Henry J. T Ince
William R. Johnson
Thomas B. Johnson
Frank H. Kelly
Max A. Levy
Philip J. Lipsett
Wilbur G. Little
James A. Lomas
Charles A. Lynires
Harry G. Martin
Oswald S. Maynard
John H. McEwan
Harold H. Mitchell
William C. E. Nobles
L Thomas O'Brien
Bertram H. Olmsted
William E. Park

1st Lieutenants—cont'd

Sumner C. Pattee
Fred L. Patterson
Charles M. Paul
Ivan B. Pippin
Julius H. Powers
Joe D. Pree
Herbert B. Priest
John W. Rose
Samuel H. Rosenthal
Ralph S. Sabine
William W. Schairer
Harry A. Schneider
Isadore Seff
Millard F. Shafer
John H. Shaw
John E. Simpson
Louis I. Skirball
William E. Smith
Charles R. Snyder
Melville D. Soash
Waldron A. Stearns
John M. Steel
E. Stanton Stofer
John F Streeter
Timothy J Sullivan
G. O. Tallenday, Jr.
Homer H. Tallman
Leopold T. Togus
Ralph R. Trueblood
Chas. H. Turkington
Elmer E. Waldo
John H Whittaker
Johan Christian Wiik
William J. Young

Medical Officers Reserve Corps

Majors

Alexander C. Abbott
George Baehr
John E. Boyd
John W. Boyce
Philip S. Doane
Marion B. McMillan
William B. Malone

Captains

William Allen
Louis J. C. Bailey

Captains—cont'd.

James A. Barker
Oliver D. Barker
Francis W. Barton
David M. Bell
Carl G. Burdick
John V. Blake
Bernard H. Booth
Sidney M. Bunker
Solon Cameron
William A. Carnes
Thos. R. Chambers
Blase Cole
Lorin Cone Collins
Eugene F. Connally
G. Worden Crissey
Peter Hoffe Dale
G. C. Darlington
John MacDiarmid
W. A. N. Dorland
Earnest Dozier
Charles H. Erway
Edwin J. Evans
Alston Fitts
William F. Graham
Douglass Haggard
John A. Harris
George D. Henderson
Richard Herriman
Ralph H. Hewitt
Harry M. Hosmer
Jos. R. Hollowbush
Chas. A. Howland
Ralph H. Hunt
Ralph P. Huyck
Edward H. Johnson
Joseph E. Johnson
William M. Jordon
Charles B. Kobert
Porter C. Layne
Elbert J. Lee, Jr.
Jas. R. Lee
Frederick W. Lester
Ray. F. Longacre
Clifford W. Losh
Clark M. Luman
Andrew F. McBride
Thomas S. McCabe
J. L. McGehee, Jr.
John J. McKenna

Captains—cont'd.

Charles L. Marston
Henry J. Meyer
Leon L. Meyer
Francis P. Morgan
Frederick C. Moor
Silvanus B. Newton
N. M. Owensby
George C. Parcher
Charles H. Parkes
James K. M. Perrine
Bertrand D. Ridlon
Horace T. Rivers
George O. O. Sautee
John S. Shaffer
Matthew J. Shields
Orrin LeRoy Smith
James J. Stanton
Harry R. Stone
Milne B. Swift
Walter T. Swink
Reeve Turner
O. C. J. von Renner
Adelbert F. Williams
John H. Wyman
George W. Yavosoky
Simon J. Young

First Lieutenants

Darius C. Asbher
Wm. B. Ackerman
James S. Akehurst
James B. Anderson
H. N. Anderson
Harvey M. Andrew
Isaac A. Arnold
Gilbert A. Ashmun
Joseph J. Austra
David T. Austin
Forrest P. Baker
Valentine C. Baker
Aaron G. Baldwin
Robt. E. Baldwin
Samuel Austin Baltz
Joseph T. Banks
John DuB. Barnwell
Raymond S. Barry
Frank F. Barthmaier
O. F. Barthmaier
George W. Batt

1st Lieutenants–cont'd

George L. Bates
Frank L. Baum
Charles M. Bauman
Abner H. Bauscher
Charles A. Bender
J. M. Beggs
Charles Bell
Charles G. Bell
Edwin S. Bennett
George Berger
John A. Biggers
Arthur Judson Bird
John L. Bishop
L. L. Blair
George A. Blakeslee
Wm. H. Blanchette
O. F. Blankingship
C. D. Blassingame
Arthur E. Bogart
T. B. Bond
Edw. W. Bookhart
J. R. Bost
Francis E. Bouza
James L. Bowman
Francis M. Boyatt
Samuel H. Boyd
Thomas M. Boyd
George M. Boyer
Albert V. Braden
Burton P. Bradley
Lawrence M. Breene
Wallace L. Britt
Harold Ogden Brown
Harvey S. Brown
George Brown Brach
Edwin P. Buchanan
W. Ralph Buchanan
Kinsey M. Buck
Robert King Buford
William J. Burdell
C. A. Burkholder
Roy W. Bury
Charles T. Butler
William G. Byrd
William D. Cagle
Andrew C. Cameron
John Joseph Carden
Arthur W. Carley
H. A. Carskadden

1st Lieutenants–cont'd

I. M. Casebeers
I. E. Charlesworth
Charles B. Chedal
T. A. Clay
John E. Cochrane
Morris D. Cohen
A. C. Colson
Edwin W. Collins
F. E. Connelly
Carroll D. Conard
William A. Conlon
Edwin H. Cooper
Thos. N. Coppeoge
Edward R. Cotham
Wm. C. Cotton
Lester M. McCoulter
Charles Stuart Cowie
Joseph S. Craig
Leonard A. Crosby
Harper L. Crow
Wilbur F. Crutchley
George Oscar Culli
Harry T. Cuming
Vernon G. Danford
Edward Davenport
Calvin W. Davis
Charles L. Davis
Elwood L. Davis
Hugh J. Davis
Urey G. Davis
Richard S. Davis
Roland A. Davison
Charles A. Dawson
Gaston Day
Arthur W. DeBell
George S. Deibert
Charles C. Deklyn
B. J. Delatow
Arthur J. Denman
George C. Devine
Frank B. DeWitt
E. A. L. Dickinson
George G. Dixon
John J. Donohue
John D. Donovan
Arthur C. Dorn
Henry B. Dorr
Ernest M. Dorsett
Horace T. Doust

1st Lieutenants–cont'd

Chauncey E. Dovell
Howard C. Down
William J. Doyle
Alexander A. Drill
Amos K. DuBell
Patrick S. Duffy
Henry Hunt Duke
John R. Dyson
Allen Walter Earl
Augustus H. Eggers
John M. Elderdice
Henry M. Emmons
Jacob L. Engle
Edward P. Essertier
Edward E. Evans
John E. Fanell
Waldo C. Farnham
Ernest E. Faubaugh
Paul H. Faucett
Daniel J. Fennelly
A. E. Fichtner
Thomas F. Finegan
Chas. C. Fishburne
Edward P. Flood
Albion E. Floyd
Ephraim M. Folsom
James B. Foster
Edward H. Fouolla
John D. Fowler
Saml. E. Frierson
Wm. R. Galbreath
Harry Charles Galey
Harry G. Gallagher
Dewell Gann, Jr.
Henry W. Gante
M. C. Garner
John O. Gaston
George J. Geisler
Cleow J. Gentzkow
Wm. R. Geraghty
Harold A. Ghering
Timothy T. Gibson
Richard B. Girvin
John F. Golden
Harold H. Golding
John W. Goodsell
Philip Gordon
Dorsey T. Gould
Corden T. Graham

1st Lieutenants–cont'd

Joseph A. Graham
Clar. A. Greenleaf
W. Lester Grogan
Thomas Y. Greet
J. A. Griffin
Wallace B. Guinn
Joseph Haas
Thurman B. Haas
William H. Haines
John Halliday
Edward E. Hamer
Drew R. Handley
Louis E. Hanisch
Henry P. Hanna
Martin J. Hanna
Carl N. Harris
William Harris
Frank Harrison
Wm. C. Hatchett
Thom. A. Hathcock
John Luke Hayden
Bernard C. Healey
William C. Hensyl
James E. Heraty
Frank J. Herbig
Horner S. Hewitt
John D. Hexom
Frederick W. Heyer
G. S. Higgins
Werner Hiltpold
Frank M. Hillyer
John J. Hislop
Frank P. Hixon
Ernest H. Hoffman
Jefferson N. Hoit
John F. Holden
Amzi W. Hon
Ernest J. Hoover
Spencer J. Hough
Wm. Haines Houston
Ira Hurst
William E. Hyskell
Frank B. Ireland
Clarence D. Jacobs
Leopold M. Jacobs
Ed. B. Junkermann
D. J. Jenkins
Elmer E. Johnson
Harold B. Johnson

1st Lieutenants–cont'd

Edgar H. Johnston
Preston J. Johnston
John R. Jones
Milton E. Jones
Lipman Miller Kahn
Alex. B. Kalbaugh
Andrew J. Keenan
Frederick E. Keller
Vincent F. Keller
Orson A. Kellogg
Charles D. Kelly
John E. Kelly
Raymond M. Kelly
Thos. B. Kelly
Sydney V. Kibby
R. C. Kory
Martin L. Koser
F. L. Knox
Clarence S. Kurtz
Henry Robt. Kutil
Justin E. Lacy
Ludlow Lambdin
Chas. R. Lanahan
Jay R. Lanning
Leonard G. Larner
John L. Lavin
Watson A Lawrence
Fred W. Lee
Harry M. Lefkowitsh
William F. Lemaire
Willard W. Lemaire
Vernon W. LeMaster
Macy L. Lerner
William C. Lester
Ray N. Lewis
Thos. K. Lewis
William G. Lewis
Henry A. Lichtig
John Gill Lilly
Jay D. Linton
George F. Lister
Otis W. Little
John H. Lloyd
Ronald O. Logsdon
Eustace Long
Joseph W. Long
W. I. Longstreth
Irving K. Lovitt
John R. Lownes

1st Lieutenants–cont'd

James L. Lubrecht
Marshall F. Lummis
Gottlieb A. Lurie
Austin C. Lynn
Waterman Lyon
Frank P. Lytle
John L. McAllister
Vincent V. McCabe
Wm. Walker McCaw
Frank E. McClane
C. L. McClellan
Frank H. McConnico
A. F. McCormick
Joseph R. McCrary
David C. McCulloch
James R. McEachern
Donald McElderry
Norman P. McGay
Hamilton W. McKay
John Wm. McKemy
Norman A. McLeod
Harlan MacMillan
Wm. S. McMurray
F. W. McNamara
A. W. McNeal
Richard L. McNeer
H. I. McPherrin
Earle Hobart McRae
Clarence H. Mackey
John J. Madden
William H. Maddox
Joseph P. Madigan
Ira J. Magee
Chas. L. Magruder
William H. Maley
Peter S. Mallon
M. Y. Marshall
Winfred B. Martin
I. W. Mayerberg
Roy Clark Meals
Doug. H. Melbane
C. L. Mengis
Joseph E. Mercer
Evan W. Meredith
John W. Merryman
Julian E. Meyer
Charles H. Meyst
H. F. Mickley
William L. Millea

1st Lieutenants–cont'd

Erastus L. Miller
James R. Miller
Richard O. Miller
Wilmot Paul Miller
Albert G. Mitchell
Carl A. Mitchell
Roscoe A. Mitchell
Frank Mock
Ivan R. Moercklien
E. W. Montgomery
Maxwell Moody
Ernest A. Moore
Gilmer H. Moore
H. T. Moore
Frank M. Moose
Alfred Mordecai
Thomas W. Morgan
Charles F. Morris
George B. Morris
Roy T. Morris
Benj. D. Mosher
Eugene A. Moulton
F. D. Mower
Henry G. Munson
James G. Murfin
Walter D. Murfin
Charles J. Murn
Edward S. Murphy
Paul August Murr
Howard C. Murray
Connell E. Murrin
William H. Nafis
DeLon R. Natbolun
Michael E. Nolan
Ward H. Norconk
David D. Oak
Theo. W. O'Brien
Stanley G. Odom
John J. O'Leary
Harry S. Osborne
Robert Emmet Owen
Benj. H. Patterson
Fred. L. Patterson
Thom. F. Patterson
James L. Parkes
Jesse O. Parker
William F. Passer
James H. Paul
Jonathan Pearson

1st Lieutenants–cont'd

George L. Pence
Milton I. Pentecost
John D. Perkins, Jr.
Edgar W. Phillips
James O. Phillips
Arthur G. Pilch
Frank H. Pinckney
Frank W. Pinger
Edmund B. Piper
William C. Pollock
Ralph E. Potter
William J. Potts
George M. Purves
Louis W. Pyan
Earle D. Quinnell
George H. Ramsey
H. L. Ransom
William J. Reddy
Frank H. Redwood
Torrance Reed
Rudolph S. Reich
F. O. W. Reinhard
Franklin H. Rice
Thomas Rice
Shaler A. Richardson
Augustus B. Riley
Dwight C. Rivera
Girard E. Robinson
John D. Robinson
John E. Robinson
John W. Rock
Edward B. Rogers
Mack Rogers
Edward B. Ross
John G. Ross
John Carter Rowley
L. Carlisle Rudell
Myron P. Rudolph
M. C. Rumbaugh
Richard L. Russell
C. P. Rutledge
Gordon G. St. Clair
T. I. St. Martin

1st Lieutenants–cont'd

Samuel L. Salasin
E. T. Sandberg
Chas. R. Sanderson
Harry C. Schmeisser
Roger Wm. Schofield
Seymour C. Schwartz
Edwin G. Schwarz
Jacob J. Schwegler
Robert D. Scott
Magnus I. Seng
William H. Seward
William J. Siegler
Grover A. Silliman
L. M. Simonson
Fayette A. Sinclair
Herbert E. Simrell
Cyrus K. Sharp
Geo. Oliver Sharrett
William Alger Shaw
Wm. Joplin Sheddon
Josephus J. Sherrill
Charles J. Shillott
George W. Shriver
William E. Skidmore
Clark M. Smith
Edgar A. Smith
Gibson Smith
Henry G. Smith
John R. Smith
William H. Smith, Jr.
Henry D. Smyser
Jacob F. Snyder
Thos. M. Snyder
J. H. Somerville, Jr.
William A. Somerville
Geo. Howard Spivey
Henry F. Starr
Samuel Stalberg
John F. Standeven
Clyde K. Startzman
John Henry Stearns
Albert L. Stebbings
John W. Stephenson

1st Lieutenants–cont'd

Lever F. Stewart
Omer H. Stewart
Jesse C. Stilley
Warren Stirling
Cecil Stockard
Fred. E. Stockton
Robert E. Strasser
O. L. Stringfield
A. C. Stroup
Baldwin S. Stutts
John H. Sturn
Louis M. Suchoff
Jeremiah B. Sullivan
John Albert Sullivan
Eddy B. Swett
Lewis Henry Taft
Francis J. Talbot
G. E. Tarkington
Hugh F. Taylor
Jas. M. Templeton
Edw. G. Thompson
S. W. Thompson
Leo R. Tighe
Calvin D. Todd
Thomas M. Toler
Samuel Topkins
Jno. H. Traband, Jr.
John Wilson Trask
Harry J. Treshler
Walter C. Trow
John A. True
Albert R. Tucker
O. Arnold Tucker
David A. Tucker, Jr.
Geo. William Tully
Harry S. Van Etten
Sidney C. Venable
Leonard M. Vincent
Matthias A. Wagner
Eugene F. Wahl
Claude W. Walker
Ralph Ward Walker
Wilder J. Walker

1st Lieutenants–cont'd

Marshall Wallis
Milton R. Walters
Charles D. Walton
Harry H. Ward
Todd P. Ward
William S. Watson
Randolph E. Watts
A. Weil
Benj. Weiner
Z. L. Weatherford
Jerome P. Webster
John B. Wells
J. Ralston Wells
Ward S. Wells
J. D. Westmoreland
Frank R. Wheelock
John R. Whisenant
Rich. B. Whitaker
H. A. White
Thos. R. Whitmarsh
William E. Whitlock
Wm. C. Widdowson
E. A. Wilcox
Allan M. Wilkinson
Irving Henry Willett
Harry B. Wilkinson
Arthur B. Williams
Creighton Williams
Lee R. Whillite
W. E. Wilmerding
Geo. Edw. Wilson
Dan H. Witt
Morris Wolff
Le Roy Womburn
James M. Woodard
Rollin D. Worden
Frank F. Wrey
Benj. F. Wyman
Oscar Yarnell
Clark H. Yeager
Eugene J. Young
Benj. F. Zobrist
John F. Zychowicz

SYMPOSIUM

"HOW THE MEDICAL SERVICES OF THE GOVERNMENT MAY BEST COÖPERATE IN TIME OF WAR"

I. Army: Col. LOUIS A. LA GARDE, *M. C., U. S. Army, Ret.*
II. Navy: P. A. Surgeon W. E. EATON, *U. S. Navy*
III. Public Health Service: Asst. Surg. Gen. WM. C. RUCKER, *U. S. P. H. S.*

I. Coöperation of the Medical Department of the Army

IN ORDER to bring out definitely the work of the three sister services, the Medical Departments of the Army, Navy, and Public Health Services, in war, it has been proposed to hold a symposium at this time which will include papers by members from these services.

Speaking from the standpoint of the Army Medical Service, we may start out with the proposition that the duties of the army medical officer in war are well defined in the manual of the Medical Department. In this we find that the Medical Department is charged with the administration of the sanitary service and its specific duties are:

(*a*) The initiation of sanitary measures to insure the health of the troops.

(*b*) The direction and execution of all measures of public health among the inhabitants of occupied territory.

(*c*) The care of the sick and wounded on the march, in camp, on the field of battle, and after removal therefrom.

(*d*) The methodical disposition of the sick and wounded.

(*e*) The transportation of the sick and wounded.

(*f*) The establishment of hospitals and other formations necessary for the care of the sick and wounded.

(*g*) The supply of sanitary matériel necessary for the health of troops and for the care of sick and wounded.

(*h*) Preparation and preservation of individual records of sickness and injury, in order that claims may be adjudicated with justice to the Government and to the individual.

The personnel which serve or may be employed by the Medical Department of the Army is made up of—

1. Medical officers of the regular army and the Medical Reserve Corps, the Dental, Sanitary, Ambulance and Veterinary Corps, and their Reserves.

2. Physicians under contract.

3. The enlisted force of the Medical Department.

4. Members of the Nurse Corps (female).

5. Officers and soldiers of the line or staff detailed for duty with the Medical Department.

6. Civilians employed by the Medical Department, and to these may be added such volunteer aid as may be utilized to supplement the resources and to assist the personnel of the Medical Department through the American Red Cross.

In the duties of the Medical Department of the Army as herein defined and in the personnel which aids it in war, there is no mention of the correlation of the other medical services of the Federal Government.

To those of us who have seen the three federal services function in peace and war this is an omission which should be corrected.

There are times when the exigencies of actual campaign bring about many conditions that, from lack of numbers in personnel as well as lack of equipment, are perplexing, and far beyond the reach or ability of the Army Medical Department to handle unassisted.

These difficult conditions were never so prominently noticed as they are in the present world war, and here I will take occasion to mention a few of them:

1. The caring for sick and destitute men, women and the infirm in devastated areas, and to furnish these with the necessaries of life, clothing and temporary shelter.

The care of refugees in war, those who were driven before an invading army or who are dislodged from their homes through the exigencies of war, will require special attention from the army medical officer, and when he is not available they must be cared for by auxiliary bodies like the Red Cross and voluntary aid societies through the medium of the Red Cross.

2. The providing relief for and guarding against the increase of tuberculosis and the spread of infectious and contagious diseases in territories held by the army and territory adjacent thereto.

If we take the subject of tuberculosis alone in France today, it is estimated that there are now in that unfortunate country 500,000 cases of this disease as a direct result of the war. The problem does not only affect France, but the prevalence of the disease is a menace to her soldiery and that of her allies as well. Scientific efforts to prevent the spread of the disease demand assistance from the best minds in the government services.

3. The caring for soldiers and civilians held as prisoners of war by the enemy and to give assistance to such civilians as are returned to their devastated regions from time to time.

All the work pertaining to the care of refugees, such as supplying them with their immediate wants, care in sickness, prevention of com-

municable diseases among them, the problem of transportation by land and sea, afford signal opportunity for the conjoint work of the federal services and auxiliary bodies.

The number of destitute refugees in France in March, 1917, according to the report of the Ministry of the Interior, was 400,000, and the number is increasing constantly. Under these conditions the housing of this unfortunate part of the population is bad, especially in the more thickly populated centers. In the cities entire families are known to reside in a single room. The bad housing and malnutrition incident to such a condition favor the undue spread of disease.

It is stated that repatriated Frenchmen from the enemy-occupied French territory are now being brought back to France by way of Switzerland at the rate of 1,000 per day. They arrive insufficiently clad and fed, in bad mental and physical condition. In such a state of affairs one sees at once the necessity for the organization and wise supervision of a quarantine depot at the point where they re-enter their own country and before they are finally distributed or billeted to the different towns for assistance.

If one stops to study the resources of the three services to take part in the symposium before us today, there is nothing in the care of the sick and injured, the destitution and disease influences brought about by war, that these services together cannot cope with. In so far as the army and navy of a country are concerned, we find many instances in history in which the two services have coöperated to great advantage. This fact was never better examplified than it was in the Russo-Japanese War on the Japanese side.

In our own country we can point to many instances of coöperation between the army and navy. "The troops under Scott's command on the march to Mexico City included marines as well as blue-jackets" accompanied by naval medical officers. "During the Civil War successful campaigns along the Mississippi and in the Gulf depended upon coöperation between the forces." One of the notable and more recent instances was the joint expedition to Vera Cruz in 1914, where the Army Medical Department and the Navy Medical Department coöperated through the medical officers attached to a brigade of marines, to the advantage of all concerned.

Finally, it may be said that the problem before us resolves itself into these questions: How can we help the Navy? How can the Navy help us? Also, how can we help the Public Health Service and how can the Public Health Service help us?

At present the Navy is responsible for all the Army's sick en route overseas, while those sick are on a hospital status. Practically all the evacuation service by sea, other than such hospital ships as the Army

may ultimately require, will be done for us by the Navy. It may be necessary, in case of a large number of wounded arriving at one time at a given port, to call upon the local hospital facilities of the Navy, or the Public Health Service to meet the emergency.

The facilities for the care of tuberculosis in the Navy Tuberculosis Hospital at Los Animas and in the Public Health Service Hospital at Fort Stanton will very likely be needed to provide for vast numbers of tuberculosis cases that may develop in the military service abroad. A certain degree of coöperation in a medical sense, now exists in the Army and Navy General Hospital at Hot Springs, Ark.

We can help the Navy abroad, as a considerable part of the Navy Medical Department is serving with Marines in French territory. Our hospitals will very likely care for the more fixed hospital requirements of the wounded of the Marine Corps. Our land transport service will logically furnish transportation for the Navy contingent. Our army supplies are better adapted for service with large bodies of troops than are the supplies furnished by the Navy Medical Department. Doubtless they will very largely use our equipment.

The navy medical methods in the trenches and on the first line must largely be those of the army methods under the same conditions and proper coöperation will mean closely identical methods of training. In an emergency there would be a loan of army medical personnel to the navy contingent, or *vice versa*.

Inasmuch as the Navy is to handle our wounded returning overseas, there must be very close coöperation between the medical officer of the base and the medical officer of the Navy handling ship service. It may be necessary here to meet temporary shortage of navy medical personnel by army personnel which would be placed on duty under the naval authorities.

Epidemics either in naval forces ashore, or the army forces with which they are coöperating, should of course be treated in the broad sense as menaces to the command as a whole. All necessary assistance and supplies should be rushed in from the most available sources, whether these be naval or military. Coöperation at ports of embarkation and debarkation is necessary to prevent the soldiers from infecting naval transports with some of the more resistant forms of disease germs.

The Public Health Service coöperates with the Army by bringing sanitation direct to the lines of the military camp. Now we can reciprocate by effective sanitation within the encampment and admonition and control of the men when outside the camps, in preventing them from creating nuisances and unsanitary conditions. Mutual reports of contagious cases are necessary. Disposal of waste by the Army for

such purposes as hog-raising should be a matter of joint coöperation. The Army must control and safeguard all sources and agents from which disease might extend from the reservation outward.

The Public Health Service must control disease conditions and sanitation outside, in such a way that the returning soldiers who have been off the reservation will not bring disease back with them. At certain times and places the hospitals of the Public Health Service may be needed to supplement the hospital facilities of the Army. The services of Public Health medical officers as specialists, to assist the Army in certain work in certain districts, may be desirable.

Coöperation between the Army and Public Health Service should be the subject of suitable orders on the part of the military authorities, based upon mutual agreement between the medical officers of the Army and Public Health Service. In an emergency supplies may be loaned by the Public Health Service to the Army.

Speaking generally, in time of war the army benefits more by coöperating with the Public Health Service than it could without such coöperation.

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II. COÖPERATION OF THE MEDICAL DEPARTMENT OF THE NAVY

The medical profession and its members, no matter how they may be subdivided into groups, more particularly at a time like the present when the world is confronted with an enormous catastrophe, must come to the foreground and undertake, as a body with a uniform intention, the application of every known scientific, humanitarian means to repair the damage done to the individual and the community so far as the field of medical practice and science is conceived and concerned.

Party, society or group lines must be removed. Experience, well formed, reliable opinion and judgment, expert ability in any given branch, the application of improved methods, adoption of measures indicative for the general good, must be given first and constant consideration. All humanitarian endeavors and activities, common to all

medicine, looking to the amelioration of the conditions and suffering of mankind must be brought to bear upon the situation everywhere at home and abroad.

The medical men of the Army, of the Navy, of any other government enterprise, and of the civil community, all must be enlisted in the common effort; all must forget sectional, selfish ends looking to the advancement or equipment of one group to the disadvantage of the other; all must bring and offer to the others that experience, that special training, that extraordinary ability, that equipment, that special provision or hospital developed to care for certain classes of injuries, diseases or conditions. In this there is no duplication of effort, no competition to obtain for any one branch what few experts and facilities there may be. Thus the best men and the best facilities will be available for all and, with the volume of cases observed, the full value of the greater experience and more improved expert methods become the reward of the sufferer in whose interest we work.

The solid mass of the medical profession must unite as one, without subdivision, in the grand purpose. The civil practitioners and specialists are the source of supply for the military, and upon enlistment in the public interest become either of the Army, or of the Navy, or of associated departments.

Medical service must be rendered under four general divisions, common to all services:

1. Provide adequate, competent, experienced personnel; medical, dental, hospital corps, nurse corps (women) to wait upon the sick and wounded.

2. Provide adequate, suitable, comfortable, desirable, pleasant hospital, convalescent and reconstructive facilities, capable of unlimited enlargement and improvement, for the care and treatment of the sick and wounded.

3. Provide plentiful, suitable medical and hospital supplies, furniture, and dressings, for use of the hospitals above mentioned and upon the field of battle.

4. Provide for the utmost possible application of all known hygienic and sanitary methods, measures, apparatus, etc., with a view to the prevention or eradication of disease or conditions detrimental to health. In this we have at hand an already well-trained, experienced aid of inestimable value in the U. S. Public Health Service with its officers and facilities.

The Army and the Navy Medical Corps, though serving under different conditions, still have much in common with each other as well as with the civil practitioner, and in a war are only another class of

specialists—specialists in military medicine, in the phase as it exists in military life. When associated or applied to the military science, coöperation must be the watchword, and the doctor is of equal if not greater importance than the general in contributing to the success of the operations afield.

(When forces of the U. S. Marine Corps are operating as a part of the forces of the Army in the field they are provided with medical personnel from the Navy. These men must of necessity assume the rôle of the army medical personnel and follow out the same methods as apply to the Army.)

The aim, organization and application of principles are practically the same in both services, varying in so far as the environment varies. Each service encounters the same problems in obtaining and providing an adequate, trained personnel, suitable medical and surgical supplies, and proper accommodations for the care and disposition of the sick and wounded.

So far as the personnel and supplies are concerned there is but one source of supply and this is common to both arms. The physicians, surgeons, specialists, men and women nurses, must come from the civil community where they have received that education and training which make their services of value and enable the individuals, after a short intensive period of instruction in the elements of military matters, to undertake work and gain experience in this new medical practice. It matters little whether these persons enter the service through the Red Cross or through the regular channels, there must be an equal distribution or such distribution as is consistent with the demands made upon the particular arm, the number of the forces to be cared for and the support of that force first called upon to meet the enemy. The Army and the Navy alike can make use only of competent personnel; the best heads, the best skill, the best organizers are none too able to meet the ever-changing and ever-emergent conditions with which they are brought face to face.

It may be fair to suppose at this time that the Navy in convoying the transport of troops may be expected to meet an armed resistance on the sea. There is nothing more helpless than a large transport loaded heavily with troops and equipment. It becomes the duty of ships of the Navy, which must have been ready at the outset of war, to protect such transports and to take the first shock of battle. This is no easy task, requires the services of many vessels and men, and is performed under adverse conditions at best, where men are exposed not only to the dangers of explosives but also to those of the elements. Medical and surgical facilities, therefore, to provide for these early engagements must

have been prepared beforehand, and thus it is necessary for naval personnel to have been provided beforehand with medical personnel who are trained, know their duties, and have the wherewithal to repair the early damages. The Navy does not, however, require so many men of special attainments or advanced age as will an army. The younger medical men who have a well-rounded training in medicine are required for the many small ships, where they can provide first aid, while the older, more experienced, or highly specialized medical men may be of the greatest value in the field with an army, where serious matters of hygiene, sanitation, expert regional surgery, etc., are needed if all is to go well with the land forces. Here, therefore, is an opportunity for the proper selection and apportionment of all classes of medical men, which should not be lost sight of in a coöperative plan.

In the apportionment of nurse personnel, either men or women, and particularly the latter, it must be remembered that the repair of those wounded and sick who are returned to the home bases, is just as important and requires fully the same if not more careful attention, reconstruction or modification, as those retained near the field of battle. All nurses must therefore not be removed from home. Some must be set aside to care for naval wounded and sick, for the naval forces must be maintained upon the sea, else the armies are struck from the rear. Nor must those left behind be any less competent and desirable than those who go overseas. The war must be fought at home as well as abroad.

Attention may well be invited here to the provisions of draft legislation. It must readily become clear to one who gives the point close thought that a draft proposition, which is entirely and absolutely in favor of the Army and eliminates the Navy, is at least unfair and unequal in conception. An army cannot exist satisfactorily without a navy to protect its rear and source of supplies and transport, nor, again, can a navy exist without an army to protect its bases, from which it operates and finds refuge. This navy will require men of all professions, which must be drawn from the same supply of man power. It is fallacious to imagine that provision should not also be made for the Navy, which should share equally and as well in the apportionment of men. The present draft provisions, therefore, are not sufficiently complete to provide for the Navy to protect the rear of the Army, and a most liberal coöperation and exchange of men must take place between the Army and the Navy if success is to result. The sources of medical officers for the Navy under present conditions are removed and all students are so absolutely under the restrictions of the draft laws and rulings as to nullify any future supply of medical men from this source for the Navy. This is also applicable to the United States Public Health Service, which

must provide for its enlarged activities in connection with the Army and Navy.

Medical and surgical supplies in large quantities, equal qualities, and similar in character must be had. Again these come from the one source common to both services. Here there is trade competition arising, in that one service may buy and bid against the other, the contractor desiring to sell for the highest price. Such competition is not to the best interests of the common buyer, the Government. It is therefore imperative and desirable that there be placed on articles needed a price fixed and well known by both medical departments. That service requiring the supplies first, to meet the call made first upon it, should be permitted to have priority, or at least not be hampered by excessive bids and unnecessarily urgent demand by the other, upon the source of supply. Standards as to drugs, dressings, containers and apparatus will make for better supply and manufacture and efficiency.

Supplies prepared by civil organizations or groups should be collected by a central bureau for proper apprortionment to the needy forces. Every effort should be bent to the end that a fair and plentiful distribution shall be made, and one medical department should not actuate methods to the disadvantage of the other.

The problems of sanitation for the most part vary between the two arms. With the Army it is those of the camp primarily; with the Navy it is those of the dwelling and the relation of one individual to another in close quarters; the larger question of ventilation of confined, overinhabited compartments, rather than the cleanliness and policing of the grounds, food and water supplies.

Here, however, a most valuable service may be rendered alike to the Army and to the Navy by the U. S. Public Health Service, which in time of war may become in whole or in part combined with or subdivided between the Army and the Navy.

This service, by assigning experienced sanitarians, hygienists, chemists and inspectors to camps, cantonments districts, laboratories, etc., of either service, or by means of its well-equipped laboratories, quarantine and isolation stations, fumigation disinfection facilities, may assist in the prevention, control, eradication or tracing down of diseases or conditions which may be or are liable to destroy the effectiveness of armed forces. The interior sections of the country as a whole or the localities about rendezvous for troops must be kept free from epidemics or insanitary conditions, water supplies must be examined and purified, vaccines, serums or other prophylactic measures and means must be supplied in reliable quality and quantity, civil manufacture of these products and also of drugs must be supervised. All these activities are

already a part of the work of this service and can be carried out to a still larger extent.

There is one place, however, where the two armed forces are brought into direct contact, that is, upon the transport, where the Army may be crowded on board into compartments inadequate in size and ventilation for the persons contained; and again the relations of the individuals, the control of epidemic, contagious, infectious diseases in crowded masses of men require attention. Here all the ingenuity of the medical officers and the applied science of hygiene and prevention of disease must come to the fore. Under ordinary circumstances the crew of the ship are well protected, have been carefully gone over for evidences of disease, suspects isolated, compartments cleaned, fumigated and aired, and reasonable assurance of the absence of contagion exists.

With the coming on board of large masses of men of an army, however, this assurance is lost, not because the same pains have not been taken by the medical service of the Army to eliminate and safeguard against disease, but because of the increased number of individuals, the increased factor of foci or carriers, from the numerically greater sources of disease (homes, towns, cities from which men come), and because large numbers of men are crowded into confined places, come in closer contact and lose that controlling influence of free air and sunlight which exists in camps. The men are at once placed under unnatural conditions, operating continuously to the dissemination of such contagion as may exist unevidenced.

As these forces draw away from land they are at once removed from their previous hospital facilities and must be provided for by the ship, in this particular. It matters not whether these embarked troops are en route to the battlefield or en route home in a wounded condition, medical attention must be available.

Under such circumstances coöperation between the medical officers of the troops and those of the transport must exist without friction and to the best interests of all. The cleanliness of the temporary residence and freedom from disease must be maintained. Not only must the provisions for ventilation of the quarters not be interfered with, but also every attention must be directed toward its greatest effectiveness. Here, especially, in the care of the health of men, both by consultation and observation at sick call, the personal endeavor of all medical officers on board must be bent toward coöperation, for the interest of the forces on board, the energies of all concerned.

The hospital is represented by the ship's sick bay. This space and the contained property are under the charge of the ship's surgeon, who is held responsible for its operation and equipment. Troop medical

officers should not endeavor to intrude upon this responsibility, but should endeavor to avail themselves of the services, not only of these hospital facilities, but also of the services of the ship's surgeon. Should, however, the ship's surgeon be unable to cope with the amount of work to be done, or desire assistance in special cases, there should be no hesitancy on his part to call upon the troop medical officers to lend a hand or give advice. Division of authority should not supersede a realization of responsibilities or necessities, and an ethical professional relation should exist to the submersion of the military standing. Wounded men on the way home must, in all probability, be placed under the care of the ship's surgeon, who will in turn relinquish their care to the army surgeons upon disembarkation.

Should it be desirable or thought necessary for any reason that an inspection be made of all men on board for evidences of communicable disease, it comes within the responsibility of the ship's surgeon to determine the existence of disease which may not only jeopardize the health of the forces on board, but also infect the ship's compartments and equipment and thus eliminate the ship as a fighting unit for a time.

So far as transportation is concerned, the Navy has not the large problem that the Army has. Transportation for the Navy is a question of evacuating ships of the fighting forces of all sick and wounded, so that these ships may be repaired and again be ready for conflict; *i.e.*, the removal of the wounded and suffering men who would act as a demoralizing influence on the crew. This transportation may be accomplished either by the ship going to port for repair and removal of wounded, the evacuation of the ship to another ship acting as a hospital transport or carrier, or to a hospital ship in the near vicinity.

The Navy, however, will be called upon to remove wounded, sick and crippled, the wastage of the Army from any cause, to the homeland. This will in most instances require the services of medical officers of the Navy to temporarily care for these patients while en route and to turn them over to the army hospitals in as good condition as possible with the means at hand and under the attendant adverse circumstances of a voyage.

We now come to the very real issue of our coöperative endeavors—the hospitals, casualty, reception and reconstruction.

Even under ordinary peace conditions the Navy has large hospitals, located at the principal large cities or naval stations, for the reception, care, treatment and disposition of the sick and injured from the fleet. There are likewise available small hospitals (sick bays) on board all ships, and also a hospital ship. There is also a dispensary (casualty) service which attends to the emergency cases or others requiring only consulta-

tion and prescription. In war time it is only necessary to enlarge and augment these establishments by a more intensive use of their facilities, or by building additional wards, etc., upon the same grounds.

These establishments, particularly the naval hospitals, assume the rôle of reception hospitals, now contemplated under the general plans of the Army Medical Department. From this point on coöperation to the greatest extent must begin, with a view to making available to the many sufferers the fullest measure of expert knowledge, experience, skill, special apparatus and other attention which may be brought to bear through the medium of reconstructional and reëducational hospitals, to which may have been assigned all the best specialists in the particular branch, who are available in this country. A division of this feature of medical work, either in its equipment or personnel, would not, in all probability, work to the best interest or results.

It is possible, therefore, for the naval hospitals to act as receiving and segregating hospitals for the Navy, and, so far as possible and practicable, for the Army also; and from them a redistribution of patients may take place to those places where exist the facilities for the proper rehabilitation of the individual.

The Navy will have few such cases as compared to the large number which may be expected from the Army. It is, therefore, most desirable that the medical officers of the Army stretch forth the helping hand, rather than that the Navy provide separately, possibly hampering the greater field by obligating desirable men.

CONCLUSIONS

Let us, therefore, hope for coöperation for the greatest humanitarian good by the medical departments of the Army, Navy, and Public Health Service under the following phases:

1. Maintain an adequate, unrestricted, unobligated source of medical personnel, so that doctors especially may not, because of an unfair draft provision, be denied their choice for service, and that the medical corps of the Navy and Public Health Service may be efficiently maintained and enlarged.

2. Aid in the early provision of medical personnel and supplies for the Navy, which may be ready, may protect our coasts and shipping, may bear perhaps the first attack upon the first line of defense, while the larger, more ponderous, less readily mobile Army machine is making its final arrangements and embarking.

3. Avail ourselves of the excellent equipment and wide experience of the U. S. Public Health Service for the common good, and make it possible that all existing provisions, or those that may be developed by

any service, can be used by either service with a view to maintaining sanitary, hygienic conditions and freedom from preventable diseases, both at home and abroad.

4. See to it that the best possible hospital facilities, no matter to whom they belong, looking to the most expert care, treatment, reconstruction and rehabilitation of the sick and wounded, are provided and manned by the most skillful personnel available.

III. Coöperation of the U. S. Public Health Service

By reason of general and special provisions of law the U. S. Public Health Service has certain responsibilities and performs functions in respect to the health of the country. While these relate ordinarily to the civil population, in times of war and extensive recruitment many of them have a direct relation to the health of the mobilized forces and constitute part of the activities essential to the effective waging of war. Other activities have been modified so as to make them more directly useful in the prosecution of the war. The activities of the service, enumerated to show their bearing upon or application in the waging of the war, are as follows:

1. Medical and surgical relief and sanitation on coastguard vessels and stations.

2. Medical and surgical relief to sick, wounded, or disabled soldiers and sailors at relief stations of the service.

3. Medical and surgical relief and sanitary supervision of interned aliens at immigration and other internment stations.

4. The operation of maritime or other quarantines in relation to military activities.

5. The loan of sanitary or other experts to the War or Navy Departments upon request of those departments.

6. Furnishing information regarding disease prevalence and endemic and epidemic localities for the benefit of military operations and the civil population.

7. The sanitation of ports and places within the United States in coöperation with state and local health authorities, to prevent danger to the health of military forces or of the civil population.

8. Laboratory examinations for diagnostic and public health purposes, in stationary and traveling laboratories of the service.

9. Supervision of manufacture of viruses, serums, toxins and analogous products, and their preparation when necessary.

10. The control of epidemics and prevention of the interstate spread of disease along lines of travel.

11. The sanitary supervision of establishments manufacturing war materials.

The duties enumerated under the first five headings are so closely related to military operations as to become a part of them. They are now being performed under executive order. They may be enlarged as required.

By reason of the great increase in traffic incident to the mobilization and provisioning of large military forces and the unusual stress imposed on all persons, many important health problems are bound to arise, affecting both military and civil populations. There is, therefore, a common service which must be performed in the interest of both. For this reason the six remaining sanitary duties enumerated above will be discussed under special sub-heads.

INFORMATION REGARDING DISEASE PREVALENCE

Presumably the furnishing of information regarding endemic and epidemic localities and disease prevalence among the civil population, for the benefit of military authorities, with special reference to mobilization and mobilization camps, will become increasingly important. This will be done. A reciprocal arrangement is also important whereby the military authorities will report regularly (to the Secretary of the Treasury) the incidence of communicable diseases among their forces.

In fact the question of the collection and compilation of vital statistics during the present national emergency, is so important that it would be highly desirable were their collection placed upon the direction of a trained statistical expert of the service and an advisory board of statisticians of national eminence.

SANITATION OF PORTS AND PLACES ADJACENT TO MILITARY AREAS, OR AFFECTING MILITARY OPERATIONS

As an aid in the selection of mobilization camps, the Public Health Service already has a large amount of information in respect to the sanitary status of many communities which could be made immediately available. On request, like information could be readily secured for other places by the detail of trained medical officers and sanitary engineers of the service who are now performing duties of this character. The records compiled by these officers in respect to the communities already studied, relate to the source, abundance, treatment and quality of water supplies, methods of sewage disposal, supervision of milk supplies, sanitary status as measured by a standard rating, local organization for sanitary work, and mortality record for a period of the last five years.

In coöperation with state and local authorities, it would be feasible to sanitate areas adjoining mobilization camps and military reservations, by this means lessening the danger of insanitary conditions adversely affecting the military forces. Expert epidemiologists and sanitary engineers are now available to coöperate with local health authorities in sanitation work, especially of malarial areas.

Not only can adjacent areas be sanitated as mentioned above, but in cities where traffic on account of military operations becomes large, expert sanitary units (medical officers, sanitary engineers, bacteriologists) can be detailed to advise and coöperate with local health authorities for the protection of health in emergencies.

LABORATORY EXAMINATIONS FOR DIAGNOSTIC AND PUBLIC HEALTH PURPOSES

A number of stationary and traveling laboratories of the Service are located in different parts of the country. These are equipped for routine examinations and research purposes and would be at the service of the military forces.

SUPERVISION AND MANUFACTURE OF BIOLOGIC PRODUCTS

Under law all commercial establishments manufacturing viruses, serums, toxins and analogous products used in the treatment and prevention of diseases of man must hold licenses issued by the Treasury Department. Their supervision therefore is now maintained by the Public Health Service and can be extended as necessary. It is well understood that large quantities of these products are required in all military operations, especially tetanus antitoxin, anti-typhoid vaccine, and vaccine virus. The commercial manufacture of these could be supplemented, if necessary, by the service laboratories.

CONTROL OF EPIDEMICS AND THE SPREAD OF COMMUNICABLE DISEASES ALONG LINES OF TRAVEL

The movements of large bodies of men will expose them along lines of travel to communicable diseases prevailing among the civil population while they, in turn, may disseminate such diseases. In accordance with regulations now in force provision must not only be made for the care of persons detained en route, suffering from communicable diseases, but the eradication of the infection from conveyances must be provided for. This will necessitate an inspection service and the establishment of communicable disease hospital facilitie sat appropriate points.

THE SANITARY SUPERVISION OF ESTABLISHMENTS MANUFACTURING WAR MATERIALS

To obtain the maximum continuous production of war material over a protracted period, the sanitary supervision of manufacturing plants and the health of workers is necessary. This has been shown by the experience of the allied nations. In an effort to produce maximum output, industry was speeded up without adequate supervision to the breaking point. In the period of initial stress, sanitary precautions ordinarily observed were disregarded. These conditions resulted in rapid decline of productive efficiency and yielded unsatisfactory results. The health supervision of industries therefore became necessary.

In order to avoid the inefficiency and serious handicap due to the lack of an organized system of industrial sanitation, like provision will become necessary in this country if the war lasts any length of time. By an extension of work now going on this supervision can be assumed by the Public Health Service. The following is a general outline of the activities required:

1. Sanitary supervision of premises, buildings, and processes of industrial plants engaged in supplying war materials to the Federal Government. Such sanitary supervision would include not only general plant sanitation, such as insuring adequate illumination, cleanliness, water supply, toilet facilities, and the like, but also the supervision of processes, so as to prevent the incidence of occupational diseases and industrial poisoning.

2. Medical supervision of workers in industrial plants with a view (*a*) to selecting work for them at which they might maintain greatest efficiency in production at a minimum physical stress, and (*b*) to rendering appropriate treatment of minor physical ailments at the plant, thus avoiding loss of time. In the event of serious illness, a correct and seasonable diagnosis would thus be assured so that proper medical treatment would be obtained at the earliest possible moment, having in view the restoration of the workers concerned to full earning capacity in the shortest practicable time.

3. Instruction in personal hygiene, by personal contact with workers, so as to obtain their full coöperation in the general sanitary measures designed for their benefit.

4. Special studies to improve and increase efficiency, and to safeguard the health of workers; such studies to include the relation of fatigue to the particular industry or process concerned, the influence of proper rest periods, the abolition of superfluous physical and mental stresses incident to the process or occupation, and the efficiency of sanitary precautions adopted in the prevention of occupational diseases.

Activities Outside the Plant.—While due attention to sanitary conditions within the plant will exercise a marked effect in maintaining a continuous state of health on the part of workers, attention must also be paid to community sanitation in industrial centers actively engaged in the production of war materials. Such conditions as defective water supply, crowded and insanitary housing conditions, surface privies, inadequate facilities for garbage and waste removal, and the like must be done away with. It is practicable for the Public Health Service to take an active part in promoting community sanitation in these industrial communities. This would be brought about by the active coöperation of officers engaged in the work of supervising industries with state and municipal boards of health.

On February 3, 1917, the Surgeon General convened a board to consider the extent and manner in which the Public Health Service could be utilized in time of threatened or actual war. The substance of the report of this board follows:

The board convened under bureau order of February 3, 1917, for the purpose of considering the extent and the manner in which the Public Health Service may be utilized in time of threatened or actual war, in accordance with Section 4 of the act of Congress approved July 1, 1903 (U. S. Statutes at Large, volume 33, page 712), which reads as follows: "*Sec.* 4. That the President is authorized, in his discretion, to utilize the Public Health and Marine-Hospital Service in times of threatened or actual war to such extent and in such manner as shall in his judgment promote the public interest without, however, in anywise impairing the efficiency of the service for the purposes for which the same was created and is maintained," met February 5, 1917, and has carefully considered: (1) The operations to be performed and their extent; (2) the manner and the status under which the Service may be utilized under such conditions; and has the honor to report as follows:

It is the opinion of the board that the service can render valuable and efficient service to both the Army and the Navy in case of threatened or actual war. This service may be considered under the following heads:

1. *Sanitation.*—(*a*) The sanitation of ports and places within the United States, in order to prepare them for camps of mobilization, concentration, or training, either for the Army or the Navy, such operations to be carried on in coöperation with State and local health authorities, or, in those cases in which they desire it, under the delegated authority of their laws and regulations. Such operations may be carried on in advance of the occupation of such ports and places by military or naval forces, in order that the health hazard to such forces may be reduced to the minimum. This work would react equally to the benefit of the civilian and the military health. (*b*) The sanitary supervision of mobilized industrial forces. (*c*) The sanitation of captured towns and places during their military occupation or pending their transference to civil authorities. (*d*) The operation of maritime and other quarantines of captured ports and places pending the resumption of these functions by the civil authorities. (*e*) The

sanitation of prison camps. (*f*) The control of epidemic diseases in the civilian or military population, and the operation of isolation camps and disinfecting apparatus for the suppression of such epidemics.

2. *Medical and Surgical Relief.*—(*a*) Medical and surgical relief to sick, wounded, or disabled soldiers and sailors at relief stations of the service. (*b*) Medical and surgical relief and sanitary assistance on board coast guard or other vessels of the military forces. (*c*) Medical and surgical relief to mobilized industrial workers.

3. The medical examination of recruits for the military or naval services at the stations of the service.

4. Laboratory operations, either of an investigative nature, or for the manufacture of bacterial vaccines and analogous products to be used in the prophylaxis or treatment of disease.

5. Instruction of males of military age in the principles of hygiene and sanitation. This will react with benefit both to the civilian and military health.

To provide for carrying out with the greatest degree of efficiency the duties outlined above, and to afford the personnel engaged protection under the laws of war, the advantage of having proper steps taken to make the Public Health Service a part of the military forces of the United States is suggested for consideration.

On February 14, 1917, the Surgeon-General addressed the Secretary of the Treasury as follows:

SIR:

Section 4 of the act approved July 1, 1902 (U. S. Stat. at L., vol. 32, p. 712), reads as follows:

"That the President is authorized, in his discretion, to utilize the Public Health and Marine Hospital Service in times of threatened or actual war to such extent and in such manner as shall in his judgment promote the public interest without, however, in anywise impairing the efficiency of the service for the purposes for which the same was created and is maintained."

In the opinion of this bureau, the effect of this act is to authorize the President to assign to the Public Health Service any duties which will in his opinion promote the public interest in the event of actual or threatened war and apparently does not limit the President as to the extent or manner in which the Public Health Service may be thus utilized, excepting in so far as this utilization might impair the efficiency of the service for the purposes for which the same was created and is maintained. Apparently the duties to be performed under this authorization of law may be in relation to the Army, the Navy, or the civilian population—any one or all three. In order that the duties, irrespective of their character, may be performed with the highest degree of efficiency and in view particularly of the strained relations at present existing between the United States and certain other powers, it would seem to be the part of wisdom to decide in advance of actual or threatened war upon a policy and plan to be followed in carrying out the provisions of the act above quoted.

The questions which now present themselves for solution may be assembled under two general heads:

1. The operations to be performed and their extent.

2. The manner and the status under which the Public Health Service is to be utilized under such conditions.

In view of the functions already legally imposed upon the Public Health Service, said functions bearing an intimate relation both to the health of the civilian and the military population, it would apparently be best for the Public Health Service to adhere to the performance of these functions as closely as possible. Furthermore. the Public Health Service is especially fitted, both by training and experience, to discharge these functions and can do so without in anywise encroaching upon the functions of any other department of the government or impairing its own efficiency; in fact, the operations outlined below can be so carried out as to increase the efficiency of the Public Health Service. It thus becomes apparent that the Public Health Service may be utilized to the improvement of its future functionation, and to the advantage of the nation as a whole.

It is believed that the Public Health Service can render valuable and efficient service to the Army, the Navy and the civilian population in case of threatened or actual war by carrying out the following operations:

1. *Sanitation.*—(*a*) *The sanitation of ports and places within the United States in order to prepare them prior to occupancy as camps of mobilization, concentration, or training,* either for the Army or for the Navy, to prevent their acting as foci for the distribution of infectious or contagious disease either in the immediate vicinity or to other states through the movement of the military forces or civilian population. In order to carry on such work to the highest degree of efficiency, it would be necessary that there be a coördination between the Public Health Service and the Army and Navy in order that information as to the location, size and purposes of such camps be had sufficiently in advance to permit of the prompt institution of sanitary measures.

(*b*) *Sanitary supervision of mobilized industrial forces.* Judging from the experience of Great Britain in the present war it will probably be necessary for the federal government to take over certain large industries in the event of war. This would have the effect of placing the employes of such industries under the benefits of the Federal Employes Compensation Act and unless the health of these employees was safeguarded by intelligent sanitary supervision there would be a greater liability of their incurring diseases and injuries which would be compensable under the law. Not only would the health of the operatives be protected in this way but their output would also be materially increased. The investigations which have been carried on by the Public Health Service render it particularly fitted for the discharge of these duties.

(*c*) *Sanitation of Captured Towns and Places During Their Military Occupation or Pending Their Transference to Civil Authorities.*—Should the nation be involved in a large war it is entirely within the bounds of possibility that certain towns and places would be occupied by armed forces of the United States. It would be necessary in such a situation to protect both the civilian and the military population. The experience of the Public Health Service in civil sanitation would render it very useful under these special conditions.

(*d*) *The Operation of Maritime and Other Quarantine of Captured Ports and Other Places Pending Their Assumption by the Civil Authorities.*—It is hardly necessary to state that the Public Health Service is the only governmental agency having practical experience in this regard and that such functions would naturally devolve upon it.

(*e*) *The Sanitation of Prison Camps.*—The congregation of large numbers of prisoners under necessarily crowded conditions is apt, unless due sanitary precautions are taken, to result in outbreaks of disease among the inmates of the camp and there would be grave danger of the spread of such diseases to the civilian population in the immediate environment. In the administration of such camps many sanitary problems connected with the prevention of the spread of vermin and the maintenance of cleanliness, as well as the discharge of excreta and other waste products, will arise. This will, in fact, require the services of a trained health agency closely coördinated with the military authorities. The experience of the Public Health Service in operating detention camps both at quarantine stations and for refugees, particularly in time of epidemic, has furnished the necessary training for the proper discharge of these duties.

(*f*) *The Sanitary Control of Refugee Camps.*—In the unsettled conditions of war the movement of masses of the population is always attended with sanitary danger. This is particularly the case in those instances in which refugees from the war zone are concerned. These persons are for the most part destitute, having none of the conveniences or necessities of a sanitary existence, and therefore extremely liable to become agents for the dissemination of disease. To this end the Public Health Service should exercise sanitary control of the camps occupied by such refugees.

(*g*) *The Control of Epidemic Diseases in the Civilian Population and the Operation of Isolation Camps and Disinfecting Apparatus for the Suppression of Such Epidemics.*—This is a routine duty of the Public Health Service for which it has the trained officers and the necessary apparatus.

2. *Medical and Surgical Relief.* (*a*) *Medical and Surgical Relief of Sick, Wounded, or Disabled Soldiers and Sailors at Relief Stations of the Service.*—This is a matter provided for by existing law and regulations and in the event of war would mean merely an expansion of the duties already performed thereunder at the twenty-six marine hospitals and the—other relief stations of the Service. The geographical distribution of these relief stations will render them advantageous. It may be pointed out, in this connection, that on account of the interference with American shipping which is apt to follow in the train of war, there will be considerable falling off in the present clientele of the service, and therefore greater facilities for the treatment of soldiers and sailors will be available. (On account of the increased number of the enlisted personnel ofthe Army and Navy under treatment at the stations of the service, it would be necessary that the officers of the Public Health Service be clothed with military authority in order to maintain discipline among these patients, to keep properly their military records and to turn the patients over to the proper military authorities upon their recovery.)

(*b*) *Medical and Surgical Relief and Sanitary Assistance on Board Coast Guard or Other Vessels of the Military Forces.*—The act of June 24, 1914 (U. S. Stats. at L., Vol. xxxviii, Chap. 124, p. 387), authorizes the secretary of the Treasury to detail for duty on revenue cutters such surgeons and other persons of the Public Health Service as may be necessary. The act of June 28, 1915 (U. S. Stats. at L., Vol. xxxviii, Chap. 20, page 800), establishing, in lieu of the Revenue Cutter Service and the Life Saving Service, the Coast Guard, provide that the Coast Guard shall constitute a part of the military forces of the United States, and operate as a part of the Navy, subject to the orders of the Secretary of the Navy in time of war or when the President shall so direct. (It is thus seen that officers of the Public Health Service are legally required to furnish medical and surgical relief and sanitary assistance on board Coast Guard vessels both during times of peace and of war. In order that these officers may properly perform their duties upon the automatic transference of the Coast Guard to the Navy, it will be necessary that they be given a military status in order that they may have the protection which is thrown about the officers of the Coast Guard with whom we are serving.)

(*c*) *Medical and Surgical Relief to Mobilized Industrial Workers.*—In view of what has been pointed out under paragraph (*b*), Section 1, it is believed that the necessity for the medical and surgical relief of mobilized industrial workers is apparent and is especially necessary in order that the period of illness and disability may be shortened and permanent injury be prevented, thus cutting down the governmental liability under the Federal Employes Compensation Act.

3. *The Medical Examination of Recruits for the Military and Naval Service at Stations of the Service.*—Paragraph 126, Regulations for the Government of the U. S. Public Health Service, require that commissioned officers of the service will examine seamen, cadets, enlisted men, both of the merchant marine, Coast Guard service, and Coast and Geodetic Survey as to their physical condition. The training which the officers have received in the performance of this function fits them for the examination of recruits for the Army or for the Navy, and the geographic distribution of the stations of the service will make is possible to perform these duties at centrally located points.

4. *Laboratory operations*, either of an investigative nature or for the manufacture of bacterial vaccines and analogous products to be used in the prophylaxis or treatment of disease. Large laboratories are maintained by the Public Health Service at Washington, D. C.; Chicago, Ill.; New Orleans, La.; Seattle, Wash.; San Francisco, Cal.; St. Louis, Mo.; Cincinnati, Ohio; Savannah, Ga.; Spartanburg, S. C.; Pittsburgh, Pa.; Ellis Island, N. Y. Smaller laboratories are maintained at practically all the other first class stations of the service. These laboratories, together with their trained personnel, would be valuable in the solution of sanitary problems effecting the health of troops or the civilian population caused by the emergencies of war, as they would be of great value in the preparation of the products above named.

5. *Instruction of Males of Military Age in the Principles of Hygiene and Sanitation.*—The officers of the Public Health Service are well trained in instructing the lay public in regard to hygiene and sanitation. In the conduct of such

work the facilities of the stereopticon loan library would be of particular value.

The foregoing is a résumé of the operations which can be profitably performed under the authority of Section 4 of the act of July 1, 1902. The question which now arises is the status under which they may be carried out most efficiently. All of these operations must be carried out with due consideration to the military necessities of the nation at the time. As outlined above this can be accomplished without encroachment upon the proper functions of either the Army or the Navy. It will be necessary, however, if this is to be done, with the highest degree of efficiency and in order that the work may be performed in close coöperation with the combatant forces, that the Public Health Service constitute a part of the military forces of the United States. This can be accomplished without in anywise destroying its integrity as a service or interfering with its proper function; in fact many sanitary reforms may be accomplished under the exigency of military necessity which could not otherwise be easily accomplished by the operation of strictly civil authority. It would seem that in view of the wording of the law that it was intended by Congress in its use of the word "manner," that this should include military position. Furthermore, unless the officers of the Public Health Service constitute a part of the military forces, they will not be entitled to the rights of belligerents, and it would seem as though their previous service with the Government entitled them to a rank commensurate with that of the other commissioned medical corps of the Government.

The foregoing explanation has been given in detail in order that all of the facts in the case may be clearly set forth, and expresses the position of this bureau on the matter. In order, however, that an authoritative legal opinion may be obtained, it is recommended that the question be referred to the Solicitor of the Treasury for an interpretation of the meaning of Section 4 of the act of July 1, 1902, in all its phases, particularly with regard to the operations which may be properly performed in consonance with the above-mentioned law, the manner in which they may be carried out, and the military status of the Public Health Service and its officers under such conditions.

Memorandum relative to the military status of the officers of the Public Health Service in time of threatened or actual war:

Legal Authority for Military Status.—Under Section 4 of the act approved July 1, 1902, U. S. Stats. L., Vol. xxxii, page 712.

It will be noted that the President is authorized to utilize the Public Health Service in time of threatened or actual war to such *extent* and in such *manner* as shall in his judgment promote the public interest.

On April 3, 1917, the President issued Executive Order No. 2571, reading as follows:

"Under the authority of the Act of Congress, approved July 1, 1902, and subject to the limitations therein expressed, it is ordered that hereafter in times of threatened or actual war the Public Health Service shall constitute a part of the military forces of the United States, and in times of threatened or actual war, the Secretary of the Treasury may, upon request of the Secretary of War or the Secretary of the Navy, detail officers or employes of said service for duty either

with the Army or the Navy. All the stations of the Public Health Service are hereby made available for the reception of sick and wounded officers and men, or for such other purposes as shall promote the public interest in connection with military operations."

It will be noted that in this order the President defined the *manner* in which the Public Health Service is to be utilized in times of threatened or actual war, that is, as "a part of the military forces of the United States." It is evident that when a service is a part of the military forces of the United States it has of necessity a military status. Inasmuch as the President has by the Executive Order above quoted directed that the Public Health Service shall constitute a part of the military forces of the United States, the officers of the said service become thereby a part of such "military forces."

The attitude of Congress in regard to this question is stated in Report No. 59, House of Representatives, 65th Congress, 1st Session, page 3, paragraph 10, which reads as follows:

"Officers and persons of the Public Health Service, therefore, may be, under the law, detailed for duty in time of war with the Coast Guard, with the Army, and with the Navy, and the Executive order above quoted gives to that service during the time of war the military status which is necessary for the proper accomplishment of their functions."

In this order the President also defined the *extent* to which the Public Health Service should be utilized in times of threatened or actual war, that is, by the detail of officers for duty either with the Army or the Navy, and by making all the stations of the Public Health Service "available for the reception of sick and wounded officers and men, *or for such other purposes as shall promote the public interest in connection with military operations.*"

Therefore the entire Public Health Service and all of its utilities are made available for any purpose whatsoever in connection with military operations. Under this authority officers and men of both the Army and the Navy are being treated at many of the marine hospitals and relief stations of the Public Health Service. The Revised Regulations for Naval Districts, issued April 10, 1917, read in part as follows:

"*Medical Treatment.*—(*a*) Where the services of naval medical officers are not available, officers and men attached to a naval district may receive office treatment from officers of the U. S. Public Health Service in the vicinity.

"(*b*) Officers and enlisted men of naval districts requiring immediate hospital treatment, where naval hospitals are not available, are entitled to admission to a hospital of the U. S. Public Health Service (marine hospital); requests by commanding officers or enlisted men in charge, made directly upon the hospital, will be made for either office or hospital service."

In consonance with the act approved June 24, 1914, U. S. Stats. L., Vol. xxxviii, Chapter 124, page 387, reading as follows: " . . . And the said Secretary (Secretary of the Treasury) is hereby authorized to detail for duty on revenue cutters such surgeons and other persons of the Public Health Service as he may deem necessary;" sixteen commissioned officers of the Public Health Service are at present doing duty on vessels of the Coast Guard.

The act approved January 28, 1915, U. S. Stats. L., Vol. xxxviii, Chapter 20, page 800, reading as follows: "That there shall be established in lieu of the existing Revenue Cutter Service and the Life Saving Service, to be composed of those two existing organizations, with the existing offices and positions and the incumbent officers and men of those two services, the Coast Guard, which shall constitute *a part of the military forces of the United States*, and which shall operate under the Treasury Department in time of peace and operate as a part of the Navy, subject to the orders of the Secretary of the Navy, in time of war or when the President shall so direct . . . ;" constitutes the Coast Guard a part of the military forces of the United States. Therefore these officers are at present actually performing duty with other military services. In addition, one officer is on duty in command of the ambulance ship *Surf*, now operating as a part of the Navy.

At all of the hospital and relief stations of the Public Health Service officers of the Public Health Service are engaged in examining recruits for the Coast Guard Service. This is also a military duty because the Coast Guard at the present time is a part of the Navy. Three officers are at the present time detailed to the Navy in connection with the investigation of an outbreak of disease, and sixteen more will be detailed to the Navy for sanitary duty in the immediate future.

Officers of the Public Health Service have at all times a relative rank with officers of the Coast Guard and indirectly with the commissioned officers of the Army and the Navy. Rank is a military right and only appertains to organizations on a military status.

From the foregoing it is evident that the officers of the Public Health Service are in times of threatened or actual war officers of the military forces of the United States in exactly the same manner as are the officers of the Coast Guard, with the exception that in the one instance the Coast Guard by law constitutes "a part of the military forces of the United States," while the Public Health Service is so constituted by Executive Order based upon law. That this is not confined to those officers who may be detailed for duty with combatant forces is evident since the entire service is at all times liable to be performing military duty of one kind or another, and it is manifestly impossible under such conditions to determine that military status begins or ends with the performance of a certain act. As a matter of fact, it is not the performance of military acts which constitutes a military status. The two things are separate and distinct. For example, an officer of the Army on sick leave or on the retired list is not performing military acts, but this does not in any way change his military status.

The following memorandum relative to the activities of the U. S. Public Health Service, as they touch the military problems of the nation, was recently submitted for the information of the Council of National Defense:

"1. The U. S. Public Health Service coöperates with the Army and the Navy by the detailing of its expert sanitarians to the Army or the Navy upon request either of the Secretary of War or the Secretary of the Navy. This is authorized by Section 4 of the act approved July 1, 1902, and is mandatory under the Executive Order of April 3, 1917. In obedience to this order one senior surgeon

has been detailed to the Army: three senior surgeons, eight surgeons, one passed assistant surgeon, and one assistant surgeon have been detailed for service with the Navy. In addition, one passed assistant surgeon and fifteen assistant surgeons are detailed for duty on vessels of the Coast Guard, now operating as a part of the Navy. These officers become to all intents and purposes, for the time being, officers of the corps to which they are detailed, and in this manner augment the sanitary resources of the strictly military corps. On account of their experience in handling large sanitary problems these officers have, it is believed, proven themselves of considerable value.

The sanitation of the civil zones in immediate contiguity to cantonments is a duty devolving upon the U. S. Public Health Service and the state and local health authorities affected. In order that there may be a perfect harmony of action, the U. S. Public Health Service has evolved a plan of action coördinating all of these agencies to the end that disease among the civilian population may be prevented or suppressed and the health of the military forces thereby protected. This plan, briefly, comprises the following:

(*a*) Rapid sanitary survey of the extra-cantonment area to determine the disease problems which are most pressing, the machinery and funds available to meet them and the amount of additional work which will be required to control, the situation.

(*b*) An offer to state and local health authorities of coöperative assistance, either in an administrative or an advisory capacity.

(*c*) The detailing of officers either in charge of the sanitation of the extra cantonment zone or as expert adviser to the state authority retaining charge.

(*d*) The detail of sanitary engineers and other experts to assist in this work.

(*e*) The detail of rural sanitary survey or rural sanitary demonstration or malarial control parties.

(*f*) The employment of subordinate personnel.

The Red Cross, in order to coöperate in this work, has created a Bureau of Sanitary Service and an officer of the Public Health Service has been placed in charge. This bureau coöperates in the sanitation of the extra cantonment zones by the allotment of funds upon recommendation of the Public Health Service. These moneys are expended in the maintenance of sanitary units, the officer in charge of the sanitation of the extra-cantonment zone being the director, and the subordinate personnel being selected by the Red Cross. Funds are also expended for transportation and supplies for these units. This work is of an emergency nature only and is intended to augment for the time being the available resources for the prevention of the spread of disease from the civilian population to military forces.

The Public Health Service has assumed administrative control of the sanitation of the extra-cantonment areas at Camps Lee, Jackson, Gordon, Pike, Taylor, Dodge, Funston, Greene, Wadsworth, McClellan, Sevier, Wheeler, Sheridan, and Shelby. Preliminary surveys have been made of practically all of the areas surrounding cantonments, with the exception of Camp Devons, Camp Upton, Camp Dix, Camp Cody, and Camp Kearny. At Camp Fremont full administrative control is not exercised, the work being entirely devoted to

the eradication of ground squirrels for the prevention of the spread of bubonic plague to troops.

In the extra-cantonment areas above mentioned the aim of the Public Health Service has been to build up the existing sanitary institutions as rapidly as possible, to insure safe water supplies, proper disposal of sewage, the elimination of disease carrying mosquitoes, the sanitary handling of foods and drinks, the accurate collection of morbidity statistics, the encouragement of anti-typhoid and smallpox vaccinations, and the prompt and effective control of disease outbreaks by isolation and disinfection. In many instances it has been necessary to make important additions to the sanitary code, particularly with regard to the disposal of night soil and the sanitary production and sale of milk.

The work is already advancing by leaps and bounds. In many of the extra cantonment zones the work of malaria eradication has advanced nearly to completion. Thousands of sanitary privies have been installed, dairies have been inspected and a safe milk supply insured. In one cantonment area alone, vaccination of the civilian population against typhoid fever has proceeded at the rate of over 3,000 per week. Model morbidity registration areas have been established around all of the camps in question and the data which is thus gained is rendered immediately available to the sanitary representatives of the Army in the cantonments concerned. In addition to this, the Surgeon General of the Army and the Surgeon General of the Navy are supplied daily with the reports received by the service regarding prevalence of disease throughout the United States.

In addition to the foregoing, the Public Health Service, through the administration of the Interstate Quarantine Regulations has been able to insure safe drinking water to troop trains and at railway stations throughout the United States. Through coöperation with the railway companies adequate toilet facilities have been installed in all stations at or around cantonment areas.

The coöperation between the various agencies affected by this work has been hearty and complete. The only difficulties being encountered are due to the lack of funds and personnel on the part of the Public Health Service. H. R. 5949, reported to the House of Representatives on September 6, 1917, provides funds for pushing this work further. Estimates originally submitted called for $100,000 for additional assistant surgeons. The committee, however, reported $100,000 for acting assistant surgeons. It will not be practicable to utilize employes of this grade for the work in question and it is hoped that this item will be changed to conform to the original estimate.

The Council of National Defense, it will be recalled, voted to support Senate Joint Resolution 63 for the creation of a sanitary reserve corps. This bill passed the Senate, but has been reported out of the Interstate and Foreign Commerce Committee of the House considerably changed. These changes do not materially effect the bill, but it is very important that the Public Health Service have a reserve on which to call in emergencies like this. It is very greatly hoped that the Council of National Defense will use its best endeavors to secure the passage of this legislation by the House of Representatives."

A STUDY OF ABOUT 2,000 PHYSICAL EXAMINATIONS OF OFFICERS AND APPLICANTS FOR COMMISSIONS MADE AT THE ARMY MEDICAL SCHOOL

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SINCE the latter part of April, 1917, a great number of physical examinations, chiefly of applicants for staff commissions in the Officers' Reserve Corps, have been made at the Army Medical School. These examinations, which at first came singly and at irregular intervals, gradually increased in frequency to a point where it was impossible for the medical personnel of the school to handle them and still do justice to their other duties.

Fortunately, just as the situation was becoming acute, it was cleared by the advent of a large number of medical reserve officers, ordered to the school on temporary duty. From time to time these have been impressed into service as physical examiners, so that there are now at all times about ten reserve officers making examinations, each serving for five days, the personnel changing in part daily by the release of two men and accession of two others.

Originally, each officer was assigned an individual applicant, of whom he made a complete physical examination. As many of the men had never before made an examination along military lines, this was a time-consuming and unsatisfactory arrangement, and it soon became necessary to supplant it by a system of "group" examinations. This proved infinitely more satisfactory and has been continued in its original form, with slight modifications, to the present time. Described in brief, it is as follows:

The applicant enters the examination room and is confronted by a large table at which are seated three medical officers, namely, a clerk to handle incoming applicants, one for the outgoing, and a supervisor, being the officer in charge. The "incoming" clerk ascertains that he has the proper authority for an examination, and enters his name, medical history, etc., on an examination form. He then secures from him a signed statement that to the best of his knowledge he is without physical disability, makes out an index card covering the case, and, clipping these papers together, hands them to the candidate, directing him to proceed to physical examiner No. 1.

The station of each examiner is designated by a large painted number (from 1 to 7) hung upon the wall, so that the applicant may find his way about without confusion, having been instructed by the "incoming" clerk to "follow the numbers." The different examiners all have their

own desk-tables and writing materials, so that they may be able to enter their findings upon the examination chart which the candidate carries with him from point to point. Examiner No. 1 secures from him a urinary specimen, plying him with water from a nearby cooler in case he is unable to void, and, in such cases, seeing to it that he makes a successful attempt at urination before the completion of his examination. The specimen is sent for urinalysis to the chemical laboratory, whence reports come up from time to time. When rapid completion of the papers is indicated, urinary tests are made in the examination room immediately upon the passage of the specimen. A table with the necessary reagents, test tubes, and an alcohol lamp, is provided for this purpose.

After seeing examiner No. 1, the applicant undresses, and then visits in turn the other officers, who complete designated portions of the examination, entering their findings on his papers. For the guidance of those just reporting for duty, specimen forms are posted on the walls above their desks, with the portions of the examination which they are expected to complete checked off in blue pencil, the remainder being left blank. Beside these are placed typewritten instruction sheets, defining minutely for each examiner his exact duties, the standards to be followed, and the terms to be used in entering the findings. By closely following these instructions, the untrained officer becomes very rapidly acquainted with his work.

In entering the findings, all items which can be answered by the words, "normal" or "none," are left blank by the examiners, to be filled in with a rubber stamp by the "outgoing" clerk while the applicant is dressing, a time-saving device which has been found quite useful. The practice of testing vision and hearing before the candidates undress has been discarded, owing to the fact that even though a deficiency in one of these senses sufficient to be a definite cause for rejection be discovered, it has been found advisable to have a *complete* examination on record.

When dressed, the applicant is given a "form" note to the board of mental examiners for the staff corps or department for which he is applying, stating whether or not he is physically qualified for commission. His examination, which is careful and complete, ordinarily consumes from 30 to 45 minutes. A single skilled examiner can make an examination of equal thoroughness in considerably less time, but with the present arrangement we have turned out as high as one examination every three minutes for hours at a time, with very little confusion.

Since the urinary findings are entered not by the examiner securing the specimen but by the "outgoing" clerk (to whom the reports are brought from the chemical laboratory), and since some of the other examiners, in the event of their findings being normal, make no entries on

the applicant's sheet (leaving the items to be filled in by the stamps, "normal" and "none," as above noted), it formerly happened that a candidate would occasionally turn in his papers and dress, without having visited all the examiners, a survey of his chart not necessarily showing that his examination was incomplete. To remedy this, a slip numbered from one to seven is now attached to the papers of all applicants, and is initialed by each examiner as the candidate visits him in turn. He passes from examiner No. 7 back to the supervisor's table, and presents his papers to the "outgoing" clerk. If all the numbers are initialed, the clerk retains the papers and instructs him to dress. Should any initial be missing, however, he is directed back to the examiner whose initials are absent from the slip.

At the close of each day, the accumulated papers are forwarded to the proper authorities, and the index cards, with any physical defects noted under the heading of "remarks," filed at the school. Whether the applicant passed or was rejected, and the destination to which the papers were sent, with date, are also noted upon the card.

A study of the cases on file has revealed some interesting facts. Of 1,440 original applicants for commission examined up to August 1, 1917, 206, or approximately 16.7 per cent, were rejected. The causes for rejection, the numbers rejected for these causes, and the percentages of rejections from the various causes, are shown in the table which accompanies.

Cause for rejection	*Total number rejected for this cause*	*Approximate percentage of rejections for this cause*
Underweight	45	21.8
Defective vision	35	14.0
Nephritis (albumen and casts in urine)	23	11.1
Heart disease (all types)	15	7.4
Deficient color vision	14	7.0
Defective hearing	13	6.3
Hernia (inguinal)	11	5.34
Vascular hypertension	6	3.0
Overweight	5	2.5
Hernia (ventral, through old appendix scar)	4	2.0
Varicose veins	3	1.5
Shortening of leg (old fracture of hip)	3	1.5
Glycosuria	2	1.0
Below required height	2	1.0

Cause for rejection—Cont'd.	*Total number rejected for this cause*	*Approximate percentage of rejections for this cause*
Loss of fingers	2	1.0
Acute gonorrhoea	2	1.0
Absence of one eye	2	1.0
Unilateral oedema of leg	1	0.5
Defective teeth	1	0.5
"Nervous seizures"	1	0.5
Undescended testicle	1	0.5
Ankylosis of elbow	1	0.5
Loss of toes	1	0.5
External ear missing	1	0.5
Severe pyorrhoea alveolaris	1	0.5
Intoxicated	1	0.5
Fixation of lower spine	1	0.5
Albuminuria (without casts)	1	0.5
Epileptic attack	1	0.5
Hematuria	1	0.5
Contracture of fingers	1	0.5
Ischio-rectal abscess	1	0.5
Loss of great toe	1	0.5
Hemophilia (history of)	1	0.5
Unreduced dislocation of elbow	1	0.5
Tuberculosis	1	0.5
Total	206	

The changes in requirements as to minimum height and weight recently promulgated, by which the minimum permissible height was reduced from 64 inches to 61 inches, and the minimum weight from 120 pounds to 110 pounds, had the effect of reducing materially the percentage of rejections from "underweight" and "deficient height" and, in consequence, the total number rejected. Thus, in a second series of 1,727 original applicants examined since this paper was compiled, underweight, as a cause for rejection, fell from first to second place, the percentage decreasing from 21.8, in the original series, to 14 in the second, its place at the head of the list being taken by defective vision, which rose from 14 per cent in the first to 23.25 per cent in the second group. The total rejections fell from 16.7 per cent to 12.5 per cent.

Of the 1,234 who were found physically qualified, there were but few who did not show a defect of some kind. Our figures in this regard are not so complete as they should be, for, during the first six weeks, the rule as to entering *all* defects on the index cards under the heading of "re-

marks" was not strictly adhered to, so that the aggregates are in most cases too low, probably by several per cent. Variations in weight of less than 15 pounds from the established normal standards were disregarded, while variations of more than this amount were noted as defects. According to this arbitrary standard, it developed that weight variations were very common among the accepted candidates. Thus, 18.4 per cent of the successful applicants were more than 15 pounds above or below the normal weight for men of their height. There were altogether 129 in the overweight group, or 10.4 per cent, and 99 in the underweight group, or 8 per cent. The next most common defect was varicocele, with 95 cases (7.8 per cent). Flatfoot (usually mild) followed with an incidence of 89 cases, or 7.3 per cent. Vascular hypertension was present in 4 per cent (51 cases).[1]

Other defects appeared in lesser percentages. Patulous inguinal rings (without hernia) were discovered 57 times, 37 times on the right and 20 on the left, both rings frequently being affected in the same individual. Visual defects of mild character were waived in thirty-seven instances. A complete table showing the commoner defects in those found qualified, including those for whom waivers were asked to cover defects that would ordinarily have been cause for rejection, is as follows:

Defect	*No. of cases affected*	*Per cent*
Overweight	129	10.4
Underweight	99	8.0
Varicocele	95	7.8
Flatfoot	89	7.3
Hypertension	51	4.1
Varicose veins	40	3.24
Defective vision (waiver required)	37	3.0
Defective hearing (anything below 20/20, either ear)	24	2.0
Patulous inguinal rings:		
Right	37	3.0
Left	20	1.6
Hemorrhoids	18	1.48
Albuminuria (no casts)	9	0.74
Functional heart murmurs	9	0.74
Deficient height (waiver required)	7	0.57

[1] In determining what should, and what should not, be considered hypertension, we have adhered fairly closely to the following arbitrary standard:

Age	*Considered hypertension*	*Age*	*Considered hypertension*
20	140 or over	45	160 or over
25	145 or over	50	160 or over
30	145 or over	55	165 or over
35	150 or over	Over 55	165 or over
40	155 or over		

Defect	*No. of cases affected*	*Per cent*
Deficient color vision (waiver required)	6	0.5
Hallux valgus	6	0.5
Hammer toe	5	0.4
Deficient chest measurement waiver asked)	5	0.4
Bad teeth	5	0.4
Hydrocele	4	0.33
Cardiac extrasystoles	4	0.33
Undescended testicle	3	0.25
Palpable kidney	3	0.25
Complete dental plate, one jaw (waiver asked)	2	0.16
Lipoma	2	0.16
Scoliosis	2	0.16
Atrophy of testes	2	0.16
Albumin and casts in urine (waiver requested by higher authority)	1	0.08
Umbilical hernia (just demonstrable; waiver asked)	1	0.08
Hypospadias	1	0.08

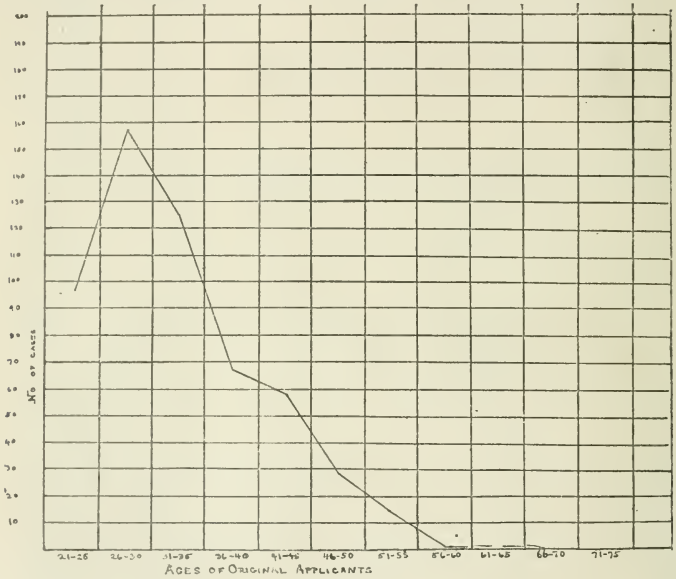
Some of the most interesting findings occurred in cases of officers coming up for their physical examinations on entry into active service. Up to August 1, some 468 examinations of this class were made, 407 upon medical officers, the remainder being divided among the other staff corps. In a number of cases (34, to be exact—all medical officers) marked physical defects were found, which should have caused the officer's rejection at the time of his original examination for commission. The policy followed here has been to recommend all such men for continuance upon active duty whenever this was reasonably possible, but in the cases of three medical officers it was considered advisable that they be either placed upon the inactive list or discharged. The defects in these cases were: (1) Marked mitral insufficiency; (2) complete ankylosis of the right knee joint; and, (3) vision in one eye of less than 20/200 not capable of correction.

Unfortunately, the age of those examined has not been noted in all cases. A compilation of the ages of 550 applicants, however, shows that the age period of 26 to 30 years embraces the largest single group of candidates. The next largest group falls in the period of 31 to 35 years, and the third in that of 21 to 25. A chart showing graphically the age groupings of the 550 cases referred to, is appended.

(It may be well to add that among the medical officers examined on entry to active service, the age period of 26 to 30 predominated also,

more than twice as many of these men falling within this period than in any other age period.)

Our figures show that the average medical officer has a greater tendency to corpulence than the candidate for other staff corps commissions. They appear also to be more given to varicocele, with an incidence of 12.5 per cent, as against 7.8 per cent for the average applicant, and to flat foot (first degree as a rule), which was present in 17.7 per cent of the medical officers examined and in but 7.3 per cent of the



original applicants. It is advisable to note, however, that but few of the examinations of medical officers were recorded during the first six weeks, most of them having been made during June and July, during which time a much more careful record of defects was kept than in the early days of the examinations, a fact which probably accounts in part for the disparity in the figures.

One point of considerable interest which has developed from a study of our urinary examination records is that the incidence of albumin and casts in the urine is considerably higher among medical officers on temporary duty at the Army Medical School than among original applicants for commission. Since the very first examination, a careful record has

been kept of all cases in which either albumin alone, or albumin and casts, have been present in the urine. The discovery of small amounts of the former has not been considered as of especial significance, but the constant presence of albumin and casts has resulted in rejection in every instance, save once when waiver was requested by higher authority. The incidence of these conditions among accepted original applicants was but 0.82 per cent (nine cases with albumin alone, and one, noted above, with albumen and casts). Among the medical officers, however, 8 cases (2 per cent) have shown albumin and casts, and 4 cases (1 per cent) albumin alone. Thus we have a total of 3 per cent for the medical officers as against 0.83 per cent for original applicants, and the figures may be regarded as complete in each group. A possible explanation for this disproportion, a ratio of almost 4 to 1, is the fact that medical officers are very commonly examined within 24 to 48 hours after having received an injection of typhoid, paratyphoid, or mixed typhoid-paratyphoid vaccine which, in many cases, results in a marked reaction, of which the albuminuria may readily be a manifestation. Support is lent to this idea by the fact that, in every instance so far, the urine of these officers has, upon further examination, become negative for albumin and casts, except in one case where albumin persisted up to the fifth and last examination. An effort was made to study urinary specimens from all candidates for vaccination, both at the time of injection and 24 and 48 hours subsequently. Several officers were detailed to this work, which was carried on for about a week, and then discontinued. The results were entirely negative, so far as the appearance of albumin in the urine after vaccination was concerned. On the other hand, reports from officers confined to their rooms by their reactions show a not infrequent development of post-vaccination albuminurias, as might readily be expected, owing to the severity of their other symptoms. Possibly a more extended study of the urines of those able to appear at the school after their vaccinations will yet yield some positive results.

In stating the ratio of albuminuria among accepted medical officers to that among accepted candidates for commission as four to one, we are assuming that the officers' urines did not contain albumin at the time of their original examinations for commission, and that all applicants for commission in the Medical Officers' Reserve Corps whose urine showed large amounts of albumin, or the presence of albumin and casts, were rejected when first examined. This would make the appearance of albuminuria in the cases of the officers examined here either an intermittent condition or one of recent origin.

Just how strongly we can rely upon this premise, however, is uncertain, owing to the fact that it has developed that the original examina-

tions have in many cases been so careless as to amount to no examination at all. It may well be, therefore, that albuminuria, with or without casts, was present in some instances at the original examinations of these officers, being either overlooked or disregarded. If this be the case, such instances should be listed as technical rejections, thus reducing the ratio.

Since the medical officers examined are all temporarily stationed at the Army Medical School, their tour of duty rarely being less than three weeks, and since their examinations are commonly made within the first three days after their arrival, ample opportunity is allowed for further study in all cases in which pathological urinary findings appear. The original applicant for commission, however, usually remains in the city for but one or two days—just long enough to complete his mental and physical examinations. The result is that in these cases the appearance of albumin and casts, or large amounts of albumin, is taken as indicative or organic disease, and results in the rejection of the candidate. That such rejections are probably unnecessary in some instances, is shown by the examples among medical officers just referred to, in which the urine becomes normal in a few days, and remains so under repeated observations. For this reason we now advise all applicants for commission who are rejected upon their urinary findings to return for further tests whenever possible.

The fact that over 8 per cent of the medical officers examined here would have been rejected by us, had we made the original examinations in connection with their applications for commission, indicates a considerable lack of care on the part of those who made these examinations, and renders an account of the defects found of some interest. For instance, four of the officers were below 64 inches in height and would have been rejected upon this ground. Thirteen were below 120 pounds in weight, the lowest weight recorded being 103 pounds.[2] At least three should have been rejected for hypertension, having systolic blood pressures of 160–170–174. Three were very obese, all more than 60 pounds overweight; one had hearing of but 4/20 in one ear and four had vision far below the minimum requirements. Two had painful flat feet; one is under observation for myocardial degeneration with cardiac dilatation (which will probably result in a recommendation for his discharge), and two were color blind. In regard to this last item, it is worthy of note that the incidence of defective color vision in all the examinations made thus far has been but 1 per cent, a figure considerably

[2] These men were all examined for commission before the new minimums of 61 inches and 110 pounds went into effect.

below that found in some of our text-books.[3] Following is a chart of the defects noted in the medical officers on entry into active service, exclusive of those recommended for discharge:

	No.	*Per cent (approx.)*
Should have been rejected	34	8.3
More than 15 pounds overweight	75	18.4
Flat foot	72	17.7
Varicocele	51	12.5
More than 15 pounds underweight	39	9.58
Appendectomy scar (not a defect, of course)	15	3.75
Weight below 120 pounds	13	3.25
Varicose veins	12	3.0
Hypertension	8	2.0
Albumin and casts in urine	8	2.0
Defective hearing (all grades)	6	1.5
Hemorrhoids	6	1.5
Patulous inguinal ring; right	5	1.25
Patulous inguinal ring; left	3	.75
Albumin in urine (no casts)	4	1.0
Vision below standards (markedly)	4	1.0
Overlapping toes	3	0.75
Functional heart murmurs	3	0.75
Color blind	2	0.5
Hallux valgus	2	0.5
Undescended testicle	1	0.25

SUMMARY

1. We have found, by experiment and in practice, that satisfactory physical examinations, numbering up to twenty per hour, can be made in several stages by a group of examiners, in which each stage of the examination[1] is conducted by a different officer. A medical man of average ability, a member of such a group, can become sufficiently acquainted with his duties in a few hours to be able to turn out work of the required character.

2. Of some 1,440 original applicants for commission examined at the Army Medical School, about 17 per cent were rejected. This is a much smaller percentage than exists in the case of rejections for enlistment. A considerable difference in the figures is, however, to be expected, owing to the higher social status of the average applicant for commission.

3. The chief causes for rejection were (1) underweight, 21.8 per cent; (2) defective vision, 14 per cent; and (3) nephritis (albumen and casts in the urine), 11.1 per cent.

[1] Our results are based on about 2,000 cases.

4. Of 407 medical officers reexamined on entry into active service, over 8 per cent were found to have defects which in the beginning should have excluded them from the service. The chief defect was underweight, being more than three times as common as any of the others, which included defective vision, deficient height, hypertension, and overweight.

5. Three per cent of all medical officers examined on entry into active service have shown the presence of albumin, or albumin and casts, in the urine. The high incidence of such findings may be due to the fact that these men are in many cases examined during a reaction following typhoid or paratyphoid vaccination.

6. Since almost all of the cases which we have studied, in which the original urinary specimens contained pathological constituents, have, after a lapse of a few days, shown a disappearance of such findings, it is reasonable to believe that many original applicants for commission, rejected for "nephritis," would have been found qualified had a more protracted study of their urines been possible. Hence it is now our policy to offer to all applicants rejected for this cause the privilege of returning daily for urinary examination, in the hope that the pathological findings may disappear. Our studies indicate that a more accurate knowledge of the processes involved in the production of ephemeral albuminurias would be of great advantage to the examiner in his efforts to separate such cases from those of true renal disease.

My sincere thanks are due to Maj. H. W. Jones, M.C., Adjutant, Army Medical School, under whose direction the examination work was instituted, and under whose kindly supervision I have continued it. Many of the devices we are now using to simplify and expedite the examinations are the results of his suggestions.

SOME AERO-MEDICAL OBSERVATIONS

By Major RALPH N. GREENE
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DURING the spring of this year, while on duty with the 1st Florida Field Hospital (Camp Wilson, Texas), I was detailed to duty as medical officer with the 3d Aero Squadron, Aviation Post, Fort Sam Houston, Texas. The immediate purpose of the duty was to provide for immediate medical attention, should there be injuries incident to the adoption of the ———— method of aeroplane control, which was supplanting the Curtiss (yoke) type of control. Through the courtesy of Maj. B. D. Fulois, chief aviation officer of the Southern Department, and by virtue of the kindly coöperation of Capt. Thomas S. Bowen, squadron commander, I was enabled to carry out certain studies and observations and, by numerous actual air flights, to form some idea of the medical aspects of flying.

To Mr. Edward Stinson, civilian instructor, I am deeply indebted for services as an aviator in numerous extended flights to altitudes ranging from nine to eleven thousand feet. The flights were made under adverse weather conditions (low temperature and extremely high winds) and included, by intent and by accident, most of the so-called aerial spectaculars, including flying upside down.

The observations, more or less pioneer, were unfortunately inconclusive, because of the rather sudden return of the 1st Florida Field Hospital to its home station at Jacksonville, Fla. It had been the desire of the writer to remain in the service long enough to present sufficient data to warrant more extended observations at the balloon school at Omaha, provided the detail could have met with proper approval in Washington. Many observations could have been made in the security and space of a balloon basket that were impossible in the narrow confines of the fusilage of a military aeroplane.

In presenting the following remarks the writer does so with a full and complete sense of the inconclusiveness of the deductions, but their presentation is inspired by the hope that others may become interested in the particular line of research and carry the investigations to a more satisfactory and definite conclusion.

I have been asked to describe the sensations that one experiences while in actual aeroplane flight. I frankly admit an entirely inadequate vocabulary and power of descriptive writing to convey in an intelligent manner the numerous mental and physical impressions resulting from an altitude flight. One is suddenly thrust from the quiet-

ude and security of an earthly abode into a new and wonderful environment. The noise and the rush of air, together with a subconscious sense of fear, which causes one to involuntarily shrink from looking over and down, are more or less overshadowed and pushed into one's mental background by the wonderful map-like appearance of a previously commonplace earth.

If you will, for the sake of comparison, picture yourself standing on a platform of evident frailty and insecurity, at the edge of a great roaring waterfall, hearing its noise and seeing its movement and feeling its magnetism, the subtle drawing and beckoning of a power so hard to resist —or, by further illustration, imagine yourself in very close and unsafe proximity to a tottering, gigantic, rapidly revolving fly-wheel, feel the electrical energy from its great belt—and know that in either instance you are in immediate danger of a horrible and sudden death, instinctively, under such conditions, you would shrink towards a point of safety and life, yet in all probability the very novelty and attractiveness of the situations would bid you linger longer; if you can fully imagine all of this, you will have a slight understanding of what flying in an aeroplane really means.

The first flight was made during a fairly strong wind, on a day registering a temperature of nineteen above zero. No sunshine was in evidence, and the few spectators had retreated to the security of a nearby hangar to escape the cutting bite of a vigorous Texas "Norther." Early in the morning, in my quarters, I had read in the morning paper of the death of a student of aviation on the previous evening. A fatal fall had occurred, although the machine had been in the hands of an able and experienced aviation instructor. The writer had desired to experience the sensation of flying, but as the moment of departure grew near his ardor and enthusiasm had waned to a degree that would have welcomed some complication arising whereby the flight might have been postponed. The calm, business-like demeanor of Aviator Stinson, while previously calling for inward admiration, did not add in any wise to a desired but utterly lacking sense of reassurance.

With an uncomfortably tight-fitting helmet, leather coat and goggles adorning my person, I lacked miserably that sense of bravado that seems to go with aviators. Carefully I climbed through a maze of taut cables, fearing that in my suppressed disconcertment I might shove a Munson army shoe through the fabric covering a wing section. The seat looked microscopically small and, being constructed of aluminum, I realized for the first time how lacking the material must be in tensile strength. After seating myself, a member of the "ship's crew" calmly fastened the belt around my body, and it seemed to me that

he must be taking inward delight in trussing me up a bit more than was needed. I imagine a man who faces the electric chair feels much the same way when a belt is gently drawn up to a point of extreme mental anguish. Doubtless all amateur aviators regard that strap, in its first application, not as a safety factor, but as an official seal of inevitable disaster.

Suddenly the motor was turned over, fired promptly, and midst the roar of the open exhausts of its eight cylinders the machine glided across the field. As it gained momentum I was aware of a spray of gasoline over my face and chest, and it naturally occurred to me that the spray from an expanding tank of gasoline, actuated by the terrific blast of an 8-foot propeller, turning up 1,400 revolutions per minute, in combination with the possible sparks from the open exhausts, might easily ignite. Suddenly the spray ceased. The danger of fire had passed, but in a moment I realized that we had left the ground and safety.

A gradual turn was made and the machine's direction of flight reversed. In a remarkably short time we had flown over Camp Wilson, which fact I verified by cautiously looking downward. The ground section below appeared like a large relief map, and though I knew we were over mesquite thickets, hills and hollows, the country appeared like a well-kept tennis court. Ugly sink-holes here and there presented an appearance as if some prehistoric animal had left gently implanted footprints. Hard-surfaced roads looked like white ribbons, stretched over the ground and leading off into the sky. Over at a distance were the haze and smoke of the city of San Antonio. The railway tracks, making as they do a peculiar turn, presented a pear-like form, much like a contour line on a map. Below was a camp containing about twenty thousand men, and the spaces occupied by the different regiments were sharply defined. A hospital train, consisting of several Pullman cars, appeared to be a dark streak on the ground. In another direction was a large reservoir which from the air looked like a small puddle of water, as viewed from the sidewalk along a muddy street. Fort Sam Houston in the distance reminded me of a military game that I had in childhood, so small was its apparent size.

I shall always feel thankful to Mr. Stinson for his calm flying during those few moments. The view was so inspiring that I had about forgotten that I was 3,000 feet up in a contrivance of wood and wire and rags. Suddenly the elevator was depressed and there followed a long, sickening nose dive, which in reality was probably not over 50 feet. The writer has always been more or less susceptible to the sinking, empty feeling in a rapidly descending elevator. Elevators are now a commonplace to me, for I suspect that in that first nose-diving experi-

ence in an aeroplane all of that kind of feeling sank out of my system forever. It had all happened so suddenly and was over with so quickly as not to allow of any particular alarm, and, too, the aviator's reassuring smile quickly dispelled my fears. Then came the banking of the machine upon its edge, this, too, without warning.

I had subconsciously kept my body tensely in alignment with the middle axis of the machine, for instinctively I avoided leaning or "rocking the boat." Suddenly the machine turned upon its side, and just as suddenly my body leaned the other way. My hands, until that time resting lightly on the steering wheel, just as suddenly and as convulsively flew outward and grasped the wooden cock-pit edge, and I wonder if a criminological expert might not even now find convicting evidence that the writer had at some time left finger and thumb prints, and possibly nail prints, on that wood. In rapid succession that machine, which on the ground looked like a quiet and graceful swan, but now had a gigantic and monstrous appearance, was rolling and roaring and banking from one side to another. With each side movement I leaned in the opposite direction and looked away from the ground.

Then, for the first and only time in my flying experiences, I became utterly disoriented. I was fully aware of the changes in the direction of banking, from one side to another, but before my eyes, in rapid kaleidoscopic succession, was a maze of earth and sky, all in a mixed and confused mass. Finally, Mr. Stinson, having amused himself to his heart's content, flew the machine flat. I realized that by looking down I could gain a perspective, but I could not bring myself to a point of courage whereby I could peep over the side of the fusilage. It is worthy of note that with the utter and extreme disorientation no suspicion of nausea presented itself.

Finally, the roar of the motor subsided to a gentle purr, the blast of wind in my face lessened by virtue of the reduced speed of the propeller, and I was conscious of a depression in the angle of flight. Looking straight ahead, earth and houses came before my eyes, and in a final, graceful swoop, the plane gently bumped against the ground and we had landed. I wonder if I looked frightened or if I were really frightened. I cannot exactly convict myself of experiencing fright in an aeroplane, but rather extenuate my state of mind by a plea of undue excitability.

On another occasion, from a height of about six or eight thousand feet, I experienced the so-called corkscrew dive, or, in more proper aerial parlance, a fixed spiral. Here the machine executes a rapid descent in the form of spirals. Should one during a spiral descent lean away from the direction of the banking and look up and off into the

sky, there would be passing before his vision, each few seconds, miles and miles of landscape. No person, under these conditions, would be very likely to escape an alarming vertigo. If, however, one has become sufficiently accustomed to air flight to lean over in the direction of descent and look straight down at the center of the circle of earth revolving below, there is practically no discomfort. It is not wise to spiral down too great a distance in the same direction, as one might under this condition be insidiously overcome by vertigo. Then, too, the too rapid change of pressure from a high to a lower altitude causes deafness and pain in the ears. This can be overcome by flattening out the machine and remaining at the same altitude for a few moments, repeating the process several times during a descent from great heights. Opening the mouth and swallowing frequently while coming down will equalize the air pressure in the Eustachian tubes and enable one to avoid this unpleasant pain and transitory deafness.

Even at great heights there is no dizzy sense of height such as one gets from standing at the roof edge of a high building and looking down. This is due, in my opinion, to lack of perspective.

In order to test out muscular control, the coördination of mental and nervous impulses, voluntary and involuntary, the writer after several flights took the controls upon signal from the instructor. At the moment of taking the controls the machine was flying nicely, and for a brief interval no manipulation of the wheel or rudder bar (operated by feet) was attempted. Looking out over the engine section and using the radiator cap to sight by, I realized that the machine was losing altitude, as evidenced by the sinking down of the radiator cap against the skyline. Then, and for a very brief (in fact, instantaneous) period I was nauseated. Upon pulling the elevator back and nosing the machine upwards the nausea promptly disappeared. On no other occasions except those already recited was disorientation or nausea a part of the experiences.

Climbing up through a cloud bank, one can usually get a rather indefinite view of the sun on the other side, even though it is invisible from the ground. This gives one a definite object whereby a particular line of flight direction may be maintained. In the clouds it is much like being in a dense fog. Above the clouds one looks upward at a spotless sky of blue and below at a wonderful silver sea, upon which is cast the reflection of the machine. The shadow is circular and across its surface is a black, bird-like shadow, surrounded by a wonderful halo of color effects. Numerous attempts to photograph this peculiar phenomenon were unsuccessful, though some wonderful photographs of cloud effects were obtained.

In coming down through a dense bank of cloud there is no perspective or sense of direction. On one occasion Mr. Stinson adopted a definite flying angle from above the clouds and dived into them. The bank of clouds was evidently very thick at this point. I could feel the machine careening gently from side to side, and gradually with increasing tension my weight went on the straps. The motor slowed down and I suspected that we were nosed straight down to expedite passing through the cloud bank. Imagine my surprise after emerging to have Mr. Stinson inform me that we had gotten upside down.

There is a certain process of mental evolution in the matter of learning to fly or in getting accustomed to flying as a passenger in an aeroplane. After the first flight there is an overwhelming sense of relief by virtue of having made a safe trip. In my case the natural nervous tension and exhilaration was followed by a state of extreme fatigue. For a night or so I was unable to sleep soundly, partly on account of being subconsciously nervous, and partly by virtue of mental analyses of the experiences and all of its wonderful and numerous details. Today one will fly and experience a side slip (caused by climbing too steeply until the flying speed is reduced to a critical speed), after which the plane will careen out sidewise and begin to fall. After landing one feels that, while interesting, an experience of this kind is one you do not care to endure again, and hesitatingly one feels that, having survived so far and having sensed the novelty of air flight, the time to quit has arrived, and one makes a resolution to this effect. Then comes fatigue, then sleep, and you awake, viewing the experience of yesterday in its true scientific light, and one is enthusiastically anxious to go into the air again and put the machine in a side slip and calmly bring it out of it again and again until the maneuver becomes a commonplace. So, day by day the sense of anxiousness subsides; you can slowly acquire the theory and practice of it all. The writer did not fly a sufficient number of hours to rid himself entirely of an inherent sense of anxiousness and remote repulsion upon looking straight down from a great height, when a fall and its consquences were contemplated. I am informed that after one hundred hours of actual flying, this timidity is overcome.

A young officer who had decided to enter the aviation service took his initial flight. It was my good fortune to be present at the time. The officer in question was a strong, robust, ruddy-complexioned young athlete. The flight was not at great height, but included some mild banking. Upon landing I was impressed with the apparent joy and exhilaration of the passenger. In a very few moments after getting out of the machine his flushed facial appearance gave place to one of extreme mottled, yellowish, greenish pallor, with marked vaso-motor

depression and shock and nausea. This lasted for a number of hours, during which the pulse was weak and very compressible.

An aviator who calmly executes looping, side slipping, long nose dives and other aerial gymnastics developed a varicocele. It pained him somewhat and he consulted a surgeon, who, after an examination, advised the possible necessity of performing a scrotal paracentesis; whereupon the intrepid aviator very promptly fainted and was in a state of collapse for several hours.

Blood-pressure readings with a Tycos instrument were made upon myself and upon Mr. Stinson at different altitudes. At an altitude of 6,000 feet our blood pressures were elevated to two hundred. The normal readings on the ground were from one hundred and ten to one hundred and twenty. The pressure from an altitude of 6,000 feet to an altitude of 11,000 feet did not exceed two hundred, either in myself or in the case of Mr. Stinson. We both seem to be free from evidences of even a slight arteriosclerosis. One is conscious of a mild, tumultuous heart action. A slight outward and upward displacement of the point of greatest intensity of the cardiac impulse was a constantly present departure from the normal. Mild acceleration in the heart action is also a constant feature, with an ever-increasing sense of roaring and tension in the head. At 11,000 feet there is a peculiar chilling, such as I have never experienced under other conditions. It is an insidious sort of chilling, with which comes an increasing sense of thirst and respiratory embarrassment, as evidenced by the necessity of taking one or more long, sighing respirations each moment or so. Mr. Stinson is several years the writer's junior, and it is worthy of notice to state that his blood pressure would remain elevated for about three hours, whereas that of the writer would decline to normal within a much shorter time.

Clinical thermometers (the only kind available) were taken into the air, and at great heights it was impossible to get a registration of the mercury column up to the normal point, with the thermometer almost wholly in the mouth for several moments. The extreme cold would doubtless affect body temperature in flights of over an hour, such as ours were, the average duration being one hour and twenty minutes.

The hmoglobin indices from both of us, taken both on the ground, while in the air, and after landing from altitude flights, showed a persistent fall of 10 degrees in coloring matter. The Talquist hemoglobin index was used in making these observations. This phenomenon was a constant feature from day to day, the return to a normal percentage invariably occurring by the time of the next test on the following day.

Observations on the question of metabolism were made by frequently

weighing myself. Fluctuations of 6 or 8 pounds were not unusual, though the writer felt unusually well during the period of the experiments.

Urine specimens from myself failed to show any marked changes from day to day, other than those that could be attributed to changes in varieties of food and variations in temperature.

Opportunity for thorough study of the changes in deep and superficial reflexes was abolished by the sudden order home, but such as were made indicated a mild exaggeration thereof. Ophthalmoscopic examinations of eye grounds were not made. Cell counts from blood pipettes were made, but failed to show any variations other than those attributable to errors in technique. Differential counts seemed to indicate a slight increase in lymphocytes.

Several civilian aviators with whom I have discussed the matter of flying and its effects on the human economy advise me that they are susceptible to the effects of height from roofs of tall buildings, that they get dizzy easily by the motion of boats, swings and other moving objects. Recently, while swimming, I experienced vertigo from turning head downward in a backward direction, from a position of swimming on my back. A couple of young men nearby in the water executed the same maneuver and stated that they, too, "got dizzy."

In general, it seems to me that flying, year after year, with an increased blood pressure, would, as a compensatory effort on the part of nature to bring about a direct ratio between pressure and resistance, eventually cause arteriosclerosis, and that, sooner or later, the hardened condition of the cerebral vessels would be a particularly dangerous predisposing factor for the development of a severe vertigo, while in the air, with the very probable likelihood of a resultant fall. Changes in metabolism, as indicated by decrease in the oxygen-carrying properties of the blood, changes in weight, etc., certainly have their significance. Cardiac hypertrophy is probably present in most cases, and, though physiological, is a feature not to be ignored in the physical examination of aviators. Air hunger and thirst are, in my opinion, simply symptoms of underlying and more important elements of the effects of altitude.

It would seem reasonable to suppose that cases of unconsciousness, while flying, may not be so infrequent, and that some of the fatal falls may be attributable to this. I have made considerable inquiry among aviators about this matter and learned of one instance wherein an aviator was making a turn, low down over a flying field, preparatory to landing and, without any sense of illness, became unconscious. He did not realize anything until he had made a fairly good landing and

had been taken from the machine. I would think that, as it applies to flying, the proof of one's ability to qualify as an aviator would result from giving the applicant an opportunity to fly as a passenger. He might develop certain symptoms, not discoverable in an ordinary medical examination, which would lead a medical examiner to promptly disqualify him. On the other hand, an applicant of doubtful qualities might readily demonstrate peculiar fitness for flying. Crucial and thorough examinations are not to be in any sense discouraged, but certainly some who pass the medical tests are eliminated because of lack of the bird instinct and for mechanical flying instead of instinctive flying. It is just as appropriate, in my opinion, to assume that some slight defect, which would ordinarily and theoretically disqualify, might by actual tests in the air prove to be insignificant after all.

These aviators are wonderful young men, and it is a source of gratification to those who by contact with them have learned of their trials and tribulations to know that, finally, they are coming into their own. None of them seem to hesitate to admit that they did not feel "natural" in the air, on a given flight.

When we consider that in present-day aerial tactics it is necessary to set a machine up on edge or turn upside down, and that during these critical moments the aviator has to utterly and completely lay aside the instinctive impulses that govern the control of aeroplanes in normal flight and for a time work a steering column backwards when it should go, ordinarily, to the front; that the wheel which ordinarily would be turned to the right must be turned to the left; that the rudder bar (whose movements affect the lateral motion of the plane from right to left, or from left to right) may act as an elevator; that the elevator under reversed conditions of air position may have to be used as a rudder; that ordinarily a rudder is worked by the feet and the elevator is ordinarily worked by the hands, and that this may be reversed—we do not wonder that after all, in spite of any medical examinations yet at our command, the proof of the pudding is necessarily in the eating. In other words, no tests are conclusive until the human mind and heart are given a fair test in the air, safeguarded by a competent aviation instructor.

TRENCH FOOT

By a Military Observer

TRENCH foot is one of the incidents of military service that has caused a high degree of morbidity. In the early development of trench warfare the British and other armies operating in northern France suffered severely from this cause. It was soon learned that there was a direct connection between exposure to damp cold and trench foot. As a matter of fact, while the term "trench foot" has been generally accepted, the condition is really one of frost bite; the liability to this is increased by the pressure of boots and puttees.

It was learned that the condition was caused by standing in cold water; efforts were made to drain the trenches and provide them with boards placed above the bottom of the trench. These walks of boards are called "duck-boards" and are found in practically all trenches on the western front.

It was found, however, that other preventive measures were necessary and, after experimenting first with waterproof shoes, oiling the feet, oiled silk socks and other steps, hip boots of rubber were found to be by far the most satisfactory means of preventing trench foot.

At present in the British service soldiers going into the trenches for a tour of duty are supplied with rubber boots, preferably those reaching the hips. On being relieved from duty in the trenches they turn over to the relief these rubber boots.

The instances of trench foot as a cause of military disability are closely followed by the Medical Department and it is found on plotting the curve for the admission of this condition that the high points of the curve coincide with cold, wet weather. In the ——— Army the admissions were high in October and November and fell in December and January during the freezing weather. They rose again during the following thaw. There is no doubt that cold water is necessary to produce this condition.

I was informed of one instance which occurred in the first year of the war, before any provisions were made to prevent the occurrence of trench foot, in which one battalion of ——— troops lost 400 men in two days; many of these men suffered subsequent amputations.

The condition is now most closely watched for. Any regiment that shows a suspiciously high number of cases of trench foot on the weekly report required for this condition has the situation investigated.

The men are instructed most carefully as to the care of their feet, and are required in going into trenches to carry with them an extra

pair of dry socks. Dry socks are also sent to men in the trenches, in waterproof packages, with the daily supply of food and water.

Whale oil has been found effective if applied to the feet before entering the trenches, inasmuch as it reduces the loss of heat from the feet by one-half. A very small amount of this is necessary to be efficient.

The appearance of trench foot is now treated as a punishable offence and is considered a reflection upon the officers in command.

This condition is obstinate to treatment and causes much suffering, particularly at night, when pain seems to remain during long intervals of time. Recently, as a means of relieving this pain, bandaging the feet and legs has been advocated; crepe has been used for the purpose with satisfactory results, the bandage being put on tight enough to produce slight pressure, and the toes first protected with cotton.

Officers who have had experience wearing rubber boots in the trenches complain that the feet are kept damp and uncomfortable from moisture that is precipitated inside the boot. As being less troublesome in this way a boot with a canvas leg is advocated, but as this leg must also be waterproof it is not apparent in just what way it is superior. It can be further stated that boots of this character and for trench service are to be seen for sale in London shops. They are made with leather soles studded with nails, to enable the wearer to keep his footing in wet clay. It is said to be almost impossible to walk in rubber boots in wet clay and carry any burden, because of the difficulty of maintaining the upright position.

The following article, prepared by the consulting physician of the ——— Army, and read at the meeting of the medical officers of the army, contains a valuable résumé of the subject.

"I have nothing very new and no startling advance, either in prevention or in treatment, to speak of this afternoon, and I hope you will forgive me if much that I say is familiar, but I trust that to the newer officers a recountal of past experience may be of some assistance in dealing with a very serious condition militating against military efficiency.

The experience on which this paper is based was largely gained during the winter of 1914-1915, when I was serving with a Field Ambulance. Since then cases have occurred only in infrequent numbers, so that it is now rare to see more than a few cases in a week from formations holding the more permanently organized lines of defense. That you, however, have been dealing with a large number of cases recently was obvious to those of us who were receiving the patients from this front at the base, and for severity they in most cases equalled those of earlier days. The success which followed the early efforts at preven-

tion, elsewhere still prevalent, must be regarded as a hopeful omen, once you have been able to secure for this area the same degree of shelter and dryness for the troops.

In the November of 1914 a very wet season was followed by a sudden snap of extremely cold weather. In the course of 48 hours the temperature fell from 48° to 12°. The trenches then consisted mainly of the natural ditches which were, of course, full of water. It was a critical time, just after the first battle of Ypres, and the troops, all too few in number, were holding an extended line. To give you an idea of the conditions prevailing, one battalion was holding a road, utilizing the camber as a defense work. The sentries were lying on this slope, and after being two hours on guard, they had to be prised off the ground, to which their clothes had frozen fast. As the temperature fell, those standing knee deep in the waterlogged ditches were gradually frozen, and on the following day the Field Ambulances were flooded with cases of genuine frostbite. Gallipoli had the same experiences. After the disappearance of the frost many cases of foot affection continued to come in, and it became obvious that we were dealing, not with genuine frostbite, but with a condition to which the term "chilled feet" and ultimately that of "trench feet" was applied, the latter being now the recognized nomenclature. It is a useful term, though it is not quite satisfactory in that cases will occur among men who have never been in the trenches, but it is almost always the fact that such men have been at work in wet horse-lines, etc., where the conditions are much the same as in a wet trench.

Passing now to the pathology of trench foot, the first point noticed is the marked similarity to Raynaud's disease. The two varieties of that disease, the blue congested and the white, are exactly reproduced. Of the two the congested form markedly predominates, but a certain number show only the dead white foot. This suggests that the primary underlying pathological condition is a vasomotor one. A certain amount of evidence is available, that the white, numb condition is a precursor of the congestion, in that cases have been seen to pass from the former to the latter. I have admitted cases in which the feet were white, numb and shrunken, and which shortly afterwards were found to be swollen and blue. This would suggest that the condition, commencing as a vasomotor constriction, passes on to vasomotor paresis and paralysis, with damage of the capillary walls, and consequent haemostasis, exudation and finally gangrene. The work of Lorraine Smith and others would indicate that the damage to the capillary wall is an early and important factor in the pathological change. The

question of a bacterial cause has naturally been raised. Originally a few cultures were made, both from bullae and from deep stabs, and streptococci were isolated. It was suggested that here was the cause, and that owing to the lowered vitality of the foot from cold, a bacterial invasion was made possible. Col. Gordon Watson has also reported a case where the staphylococcus albus was isolated.

But I think the evidence is insufficient to prove that bacteria are the first cause of the condition, and I regard the bacterial invasion, which undoubtedly does occur, as secondary; the growths obtained being those of the ordinary epidermal organisms, or those constantly present in mud, which have the power to become pathogenic in devitalized tissues. Recently some French observers have again raised the point, as you probably know, and claim to have grown from cases of trench feet organisms which are prevalent in trench mud, and which they regard as causal. They further state that, especially among the native troops, a septicaemia has been seen in trench feet cases, with haemorrhages, nephritis, jaundice, etc., and state they have isolated from the gall bladder of fatal cases of this an organism (they call it a mycosis), which, inoculated into rabbits, reproduces skin lesions exactly resembling the scabs of trench foot. I have heard of no such case in the British armies, and I do not think their report is in any way convincing. In fact, their description of the cases of septicaemia would seem to indicate that they were cases of infective jaundice. Based on their theory they have made suggestions for prevention and for treatment, which, while in some respects helpful as will be seen later, are in others impracticable. To disinfect the mud in the trenches, for example, would be an impossible task.

Last week, an enthusiastic writer to the *Lancet* ascribed trench foot to the leaking, through wet feet, of the electrical energy manufactured by the central nervous system, and suggested the use of dielectric oil, a remedy which is, I believe, now advertised for many ailments. His presentation of the argument, however, was not to my mind at all satisfactory.

So far as I can weigh the evidence, it seems that a vasomotor paralysis and ——— are the essential underlying conditions. They lead on to extravasation, which forms a suitable nidus for bacterial growth, and the final stage is either that of gangrene or of a slow return to the normal. A peripheral neuritis is an almost inevitable sequel, and it is this neuritis, obstinate and lasting, which is the great difficulty in the after history. It may be toxic in origin, owing to the bacterial infection which is present, or directly caused by cold. The nerve trunk

mainly involved is the anterior tibial, and I have seen a spreading anaesthesia, rising higher each day, along the area of distribution of this nerve.

The main etiological factors in the production of trench foot are *cold and wet in combination*. Pressure is an aggravating factor, but cannot be regarded as a cause. A wet trench is therefore an ideal place for the production of trench foot in winter. Cases do not occur in the summer, though often the trenches are very wet during the summer rains. Nor are they common in cold though dry weather. The cold wet, leading to rapid heat loss, would naturally cause a vaso-constriction, which, if unduly prolonged, will pass on to paresis. Those of you who suffer from cold feet or cold hands will remember the unpleasant numbness which rapidly comes on when fishing in a cold rain or motoring with wet feet. It is obvious that pressure, whether of puttees shrunken by the wet or of boots too tightly fitting, will further impede an already embarrassed circulation and so increase the vasomotor trouble, but it is, I think, a mistake to regard pressure as a cause. Some German writers have tried to prove that men wearing boots and leggings suffered more than those who wore the long field boot, but they failed to show that this was due to the pressure of the legging, and ignored the fact that the boot and legging admitted water more easily than the field boot. I have, moreover, seen Germans wearing the long boot who suffered severely from trench foot. Further, the idea that Highland regiments, wearing hose, suffered less than those wearing puttees, has not been confirmed by actual experience, when the other conditions were identical.

The onset of trench foot is insidious. The most usual history to obtain is that the patient felt his feet getting colder and colder and ultimately lost all feeling in them. Pain, beyond the initial discomfort associated with cold feet, was not complained of at first. Later, as the feet began to swell, there was pain around the ankles, at times extending up the calves. You will notice that the pain was confined to the parts where the circulation, though impeded, was not stopped.

If at this stage the man removed his boots, the feet immediately swelled so that it was found impossible to replace the boots. If the boots were not removed the man could usually hobble along, with difficulty, as his feet were insensitive. It used to be a melancholy sight to see a battalion coming into rest billets, creeping along at about a mile an hour, the men hobbling along as best they could.

As soon as the boots were removed the oedema appeared and this is the stage at which most admissions to Field Ambulances are seen. In the majority of cases the feet are swollen and show all degrees of color change, from a bright pink blush to a dead black gangrenous

appearance. In the worst cases the skin is covered with a bullous eruption, the bullae containing a blood-stained fluid. A few show only the dead white appearance, but, as already stated, this may rapidly pass on to the state of oedema. The discoloration is usually sharply demarcated. It may involve only the toes, but frequently extends to the mid-tarsal joint, suggesting that the part of the foot immobilized by the rigid boot toe suffers most severely, whereas where circulation, owing to ankle joint movements, is brisker, the trouble is mitigated. The mild cases exhibit only a bright pink blush over the tips of the toes and over the ball of the great toe. The latter spot, owing to its exposure to the greatest boot pressure, is the most vulnerable part of the foot. (X-ray findings.)

To the examining hand, all the cases are at first stone cold, whatever the degree. In all types and degrees a patchy anaesthesia is present in the majority of cases. Epicritic sensibility is most frequently involved, the next being the thermal, while pain sensibility is the last to disappear. The anaesthesia must be regarded as a result of the neuritis.

The progress made by the cases varies considerably. Those admitted in the early stages soon lose the numbness, and the natural color returns. As circulation is restored, pain is the chief complaint, and this persists long after the foot is warm to the touch and of healthy appearance. It is neuritic in character and appears to be very severe. This is especially so at night, so that it is no uncommon thing to find men sitting up and crying with pain. Warmth exacerbates and the patients prefer to sleep with their feet uncovered by blankets. The nocturnal character of the pain and the fact that it is increased by warmth are two useful points to remember in dealing with possible malingering, and a quiet round of the wards late at night will often help to form an opinion. Associated with the pain there is usually hyperaesthesia, mainly of the edges of the feet and the tips and balls of the toes. This is so marked that walking is difficult and even gentle massage may not be tolerated. The hyperaesthesia is accompanied by the patchy anaesthesia already mentioned, and which is most usually found along the course of the internal and external plantar nerves, especially the former. At first it was our practice to keep these mild cases in the ambulance, especially as we had a longer limit for retention then, even up to 3 weeks. But we were usually disappointed in the progress, and the continued pain, leading to disturbed rest, ultimately led to the great majority of the cases being evacuated to the base. The neuritis is more pronounced and more lasting than the first appearance would suggest as likely.

Patients admitted with swollen and apparently gangrenous feet complained of little, and were for the most part free from, pain. If

circulation has not been finally stopped, the color gradually returns and the black appearance gives way to a blue lividity and this to a bright pink color. At this stage, with lessening oedema, pain again becomes the predominant symptom.

In very severe cases, admitted with bullae over the feet and all the appearances of gangrene, the appearance suggests that loss of the greater part of the foot must inevitably follow. Happily this is not at all frequent, and usually only superficial sloughing, with little loss of actual tissue, supervenes. I only saw one case, among those admitted to a general hospital in November, in which amputation of the feet became necessary.

Prognosis is not easy because we have not heard much of what happens in England. The very mild cases should be fit for duty in about three weeks. Those with oedema will take much longer, and so far as I can learn three months is an average period to elapse before they can be discharged from hospital. In all cases it is recognized that, while apparently cured, there is a greatly increased susceptibility (vulnerability) to cold.

When I was home five weeks ago I saw an officer whom we retained in the Ambulance for three weeks in November, 1914, as he was apparently very mildly affected. He was ultimately evacuated and was not well till May, 1915. All last winter he suffered again from pain in the feet during cold weather, and this winter also has not been fit to rejoin owing to the same cause.

Diagnosis need detain us only very briefly, as the bad cases are obvious. The very mild cases, seen when there is no swelling, may present more difficulty, and these are the cases diagnosed, possibly for ulterior reasons, as neuritis of feet, I. C. T. feet, etc. I have already mentioned the diagnostic value of nocturnal pain and of intolerance of warmth. In addition, close examination will usually reveal the polished wrinkling of the skin caused by past swelling. A pink color over the tips of the toes and over the first metatarsophalangeal joint is suggestive. Lastly, blurred sensation and pain on pressure should be looked for. The best way to elicit pain is to squeeze the metatarsus gently, as one would in examining a case of Morton's metatarsalgia, at the same time distracting the patient's attention. Any of the above signs, in combination or singly, should clinch the diagnosis.

Treatment is both preventive and curative. Dealing with the latter first, it is not cheering to have to confess how impotent treatment is. The wards should be kept well warmed, but owing to danger of burns the patients should not be allowed to sit near the fires. For the mild cases a warm foot-bath should be given daily, and this should be fol-

lowed by massage, which is preferably given twice a day, as soon as friction can be borne. It is wise to teach as many of your orderlies as possible the elements of massage, and show them also how to instruct the patients to carry out the rubbing of their own feet. As progress is made the patients must be encouraged to move about and ultimately to go for short marches. The French use a special soap in the foot-bath, made as follows:

Soft potash soap	1,000 parts
Powdered camphor	25 parts
Powdered sodium borate	100 parts

With mild cases of oedema, elevation of the feet to combat stasis is wise, and the feet should be powdered with boric acid twice daily and kept covered with cotton wool. As the oedema lessens and circulation returns, massage should be instituted.

For the severe cases, little can be done beyond elevating the feet and keeping them wrapped in wool and firmly bandaged. These cases will need to be evacuated to the base. Where bullae are present they should be tapped and the whole foot painted with 1 per cent picric acid, which is antiseptic and mildly analgesic. The French advise removal of the skin of the bullae and treatment of the raw areas with the following solution, applied by sterile swabs:

Powdered camphor	1 gram. 10
Sodium borate	15 grams
Boiled water	1 liter

The whole foot is then covered with a moist compress of this solution, which is renewed daily. In very severe cases they spray the whole foot for a quarter of an hour, before applying the compress, with a mixture of equal parts of hydrogen peroxide and a solution of borate of soda (1 per cent). I have no personal knowledge of this treatment.

The alleviation of pain is the greatest problem. I have tried tincture of iodine, glycerine of belladonna and all the coal tar preparations internally, but with very disappointing results. In severe cases of pain, morphia, preferably by the mouth, is the only drug to give relief. High frequency treatment is being tried in the Second Army, and is giving promising results. This method of treatment is worthy of a more extended trial.

Obviously the main problem for us is that of prevention, and the various instructions to this end have been issued after experience was gained as to the best methods to follow. The ideal preventive measure is to have dry trenches and the responsible authorities aim to secure

this by pumping, boarding, borrow pits, etc. It is important to remember that the communication avenues must also be kept dry, so that reliefs may enter the trenches dry-footed.

A battalion to be relieved may well be expected to see that all possible is done to keep the communication trench up which its relief will come. As a preliminary to entering the trenches an elaborate ritual has been ordained, including boot and foot inspection, and the oiling of the feet. It is an order that boots shall be roomy so as to permit of two pairs of socks being worn, and allowance must be made for the wet leather shrinking, and for the static oedema of the foot which must follow when men are standing for a prolonged period. It is well to fit the boots to the left feet, rather than to the right, owing to the fact that in the majority of men the left foot is larger than the right. It is a matter of observation that the left foot is more frequently and more severly affected than the right, and the unequal size may be the cause of this. The boots must be well greased at intervals, to keep the leather supple and to prevent it becoming waterlogged, and special attention should be paid to the welt and the seams, to preserve the stitching. Men should be instructed not to lace their boots too tightly and to wind the puttees loosely. The oiling of the feet is not a fetish but is founded on sound experimental evidence, as follows: A healthy man was placed with his feet immersed up to the knees in cold water, for a fixed period. The heat loss was measured by estimation of his superficial and deep temperatures and that of the water. On the following day a similar experiment was carried out after the man had had his feet well covered with whale oil, and the heat loss was found to be reduced by 50 per cent. The oiling should be done as a parade and an excess of oil must not be used. Only the thinnest of films is needed and the oil should be well rubbed in. You will remember that the oil coat on the feathers of aquatic birds is extremely fine. If excess be used the men complain that it causes a cold feeling. This complaint we tried to overcome by the addition of mustard, but the powdered mustard was no use and the essential oil was unobtainable in sufficient quantities. A grease is also issued which has the advantage of needing rubbing for its application, but as a trench issue the oil has advantages as in those rare tactical conditions when the boots cannot be removed it is possible to pour a little oil in the top of the boot and allow it to diffuse over the foot.

When in trenches constant care of the feet is essential. Everybody now realizes the importance of the daily removal of the boots. In this way opportunity is offered for friction and re-greasing, congestion is lessened and dry socks can be put on. The men must be taught to carry their spare socks in a dry place. Exercise in the trenches is not

easy to carry out, but something can be done to help, as for instance, by the provision of tarpaulin on which the men can lie down and do overhead exercises with their feet. They should also be encouraged to stamp their feet, and to move their toes about inside their boots.

I do not think it is a sound practice to provide hot water for foot-baths in the trenches as it may cause some swelling of the feet, which will lead to subsequent constriction on replacing the boots. In very cold but dry weather, sandbags pulled over the feet stuffed lightly with straw and secured lightly round the leg will be helpful in keeping the feet warm.

On reaching rest billets the feet need attention. Washing should be encouraged and lukewarm water should be provided. It is an advantage to add a little mustard in the proportion of half an ounce to a gallon of water, or the French soap containing camphor may be used. After drying, fresh socks should be put on.

It will also help if some system of drying the boot be adopted. Some divisions have drying rooms for the gum boots, but this needs to be done very carefully without overheating. Failing a special room the gum boots should be placed to dry, not hung upside down as so frequetly done, as this only spreads the internal moisture over the leg, and evaporation is slow, but in a rack with the heel lowest. The water then drains into the heel, whence it can easily be sopped up.

Such is the generally accepted routine, which, while not entirely abolishing trench feet, will yet go far to minimize suffering and loss from this cause.

PREVENTION OF CHILLED FEET AND FROSTBITE

Officers commanding units will be held personally responsible that every officer makes himself thoroughly familiar with the leaflet "Chilled Feet and Frostbite" issued by the Army.

Experience in the worst part of the line shows that where effective preventive measures are taken the so-called trench foot does not occur. The occurrence of even a single case in a battalion is therefore a reproach to the unit concerned. The following preventive measures will be adopted forthwith:

1. *Foot Preparation Rooms.*—Each brigade will provide rooms in which the feet of men will be washed in tepid water and rubbed before proceeding for a tour of duty in the trenches. The A. D. M. S. will provide personnel for supervision of these rooms.

2. *Drying Rooms.*—Each brigade will arrange for rooms in which clothing, socks and puttees can be thoroughly dried and dry socks provided on the return from trenches.

3. *Provision of Dry Socks.*—A pair of dry socks for each man will be

sent to the trenches with the rations daily. Wet socks will be sent back to transport lines by ration carrying parties. Socks will be sent up in waterproof boxes or bags.

4. *Fitting of Socks.*—Socks must not fit tightly and should be inspected as carefully as boots.

5. *Care of Ankle Boots.*—Company officers will see that the following precautions are taken regarding boots: (*a*) Sound laces will be provided to facilitate taking off of boots, as knotted laces delay or prevent removal. (*b*) Boots will be dubbened outside to keep out wet. (*c*) Boots will be fitted loosely. (*d*) Boots will be laced loosely. (*e*) Boots will be kept in good repair.

6. *Care of Gum Boots.*—Brigades will make arrangements for the drying of gum boots. Officers commanding will be responsible that gum boots are properly stored when not in use. They must not on any account be left on the ground outside dugouts.

7. *Care of Puttees.*—Puttees must always be applied loosely and when they become wet must be taken off and reapplied as they shrink on becoming soaked with water.

8. *Removal of Boots in the Front Line Trenches.*—Platoon commanders must arrange for each man to take off his boots at least once in the twenty-four hours. A scheme will be worked out for men to do so in rotation even if it is necessary to sit on the parados at night.

9. *Stamping Exercises.*—Circulation will be kept up by stamping when possible and keeping the men employed in various ways. Nothing is more conducive to trench feet than standing about.

10. *Personnel for Supervision of Preventive Measures.*—Regimental stretcher-bearers will assist company commanders in the supervision of preventive measures, and two men per platoon will be trained by regimental medical officers in foot massage. On relief after a spell in the trenches these men will be sent ahead to rest and be prepared to start operations as their platoon arrives.

A trained masseur of the R. A. M. C. will start a course of instruction of foot massage for regimental stretcher-bearers forthwith.

11. *Hot Food and Drinks.*—The provision of hot food and drink is of first importance in the prevention of the conditions which predispose the trench foot.

Officer commanding will arrange for their men to have at least two hot meals a day; for preference one in the middle of the day and one between midnight and 5 o'clock a. m. Food containers of the Thermos variety are available and should be used to the fullest extent. They can be readily supplemented by petrol tins placed inside a double chambered wooden box with a layer of sawdust between the two boxes. Two 2-gallon petrol tins used in this way will give 64 men half a pint of hot soup or cocoa each.

12. *Transport Lines.*—Men working in the wet transport lines of the Ypres salient require consideration only next to that of men in the trenches.

Transport officers will see that the precautions outlined above are carefully observed.

13. *Anti-frostbite Grease and Whale Oil.*—All ranks must clearly understand that the grease or oil supplied is merely a lubricant to facilitate rubbing of the feet. The grease has no inherent quality and merely smearing the feet is worse than useless The feet must be rubbed until all grease or oil has disappeared and they are quite dry.

14. *Feet Inspection.*—Platoon commanders must be made to realize that the condition of their men's feet is as important as the condition of their rifles and that feet inspections are just as essential in trench warfare as in marching tests. A good platoon commander should be as familiar with the condition of his men's feet as he is with the cleanliness of their rifles."

TRENCH SHIN

A correspondent of *The Lancet* writes:

"While greatly interested in Lieutenant Colonel Graham Chamber's paper on 'Trench Shin' in your issue on May 19, experience does not lead one to agree with all he has to say regarding etiology and treatment. Opportunities for observing this complaint have been incessant during two and a half years' work with a battalion on the Western front, though there has been no chance of following up the more severe cases. If the disease is microörganic in origin and possibly infective, which seems probable, constriction and exposure must play a very minor part. Last winter this battalion suffered more from exposure and deep mud than even in 1914, yet more cases are occurring now when the weather is good and the recent fighting has been more or less in open and clean country. Experiences in 1915 and 1916 bear this out. If the puttee played an important part as a causative factor, one would expect far more cases in the infantry, and the incidence of the disease (like the wearing of the puttee) to be continuous. The name "infectious fibrositis" precludes constriction and exposure. Those who previously held that trench foot was due to the tight puttee, and others who now hold it to be an infection with *Scopulariopsis koningii* from contact with mud, will both doubtless find analogical comfort in this paper on 'Trench Shin.'

"With regard to experimental treatment, in slight cases, one's energies are naturally limited by the medical pannier. The pain is most intractable; to relieve it and so give sleep, aspirin, phenacetin, and sodium salicylate quite fail in small or large doses; opium has disadvantages; in fact, morphia injections alone are reliable, and they of course cannot be repeated indefinitely. The pain is greatly increased by constriction and bandaging; lessened by gentle massage and the use of liniments. Complete rest, unless the pyrexia is marked, does not seem so desirable as 'light duty,' because the pain is at its worst when resting. Elevation of the legs is indicated. The disease seems self-limiting, and tonics and rest usually restore the health in from 10 to 30 days. After careful inquiry and observation, the much suspected and often guilty louse has been let off."

EDITORIAL

PHYSICIANS AND PATRIOTISM

THE MILITARY SURGEON extends its congratulations to and welcomes into the military service of our country the more than twelve thousand physicians who have accepted commissions in the Medical Reserve and have been assigned to active duty. Many of these are already members of the Association of Military Surgeons U. S. and all have been invited to submit their names for membership, so we feel that we can take them all into our confidence.

Those of us who have looked deeply into the requirements of the sanitary services know that, from front to rear and at home, an army in active service needs one physician for every hundred men on the rolls. This seems a large percentage, but when it is recalled that the wounded are carried back by successive stages and each stage must have its medical personnel, though all may not be equally busy at the same moment, this number of medical officers is essential to the best results, and lacking it the army is by so much lacking in efficiency.

Just now we have immediate need for some 20,000 medical officers. Of this number practically 12,000 are enrolled and, we are informed, that more than 15,000 have been recommended for commission in the M. O. R. C. As shown in THE MILITARY SURGEON[1] this is 15 per cent of the total number of available practicing physicians. We question if any other profession equals this; yet our country asks even more.

Of course we realize that for many of us the decision is of apparently grave individual importance and much would seem to depend upon it. But if one's house is afire he does not stop to weigh the possible consequences to himself and family should he endeavor to put the fire out, he just does it. This is to all intents the situation with us today; we are in imminent danger of losing not only our homes but that which is dearer even than life—our liberties. The fate of our nation may hang on the decision of this hour.

With such a showing it cannot be thought that the majority of our medical men are indifferent to the situation; but any lagging back at a time when it is the plain duty of every citizen to prove his loyalty, support the Government in the conduct of the war and do voluntarily what all other governments would demand unconditionally under the circumstances, must cast discredit upon the medical profession in the United States.

[1]THE MILITARY SURGEON, Vol. xl, p. 438.

It is unthinkable that there is hesitancy because of physical fear. We have the best of testimony that the medical officers in the present war are brave even to rashness and we pride ourselves upon the fact that courage is a time honored attribute of the followers of Æsculapius.

The Military Surgeon has never hesitated to call attention to the well established fact that medical officers took the same chances in active service that other officers do, more indeed than some, and always resented the imputation that we enjoy a safe billet at the rear, under the more or less contemptuous appelation of "non-combatant." Nevertheless recent newspaper fables have grossly, persistently and apparently with ulterior motives, exaggerated the casualty rate among medical officers on the Western Front. A Washington paper recently repeated the oft-recurring bromide that the British Army had lost 60,000 medical officers in the last three years, whereas, as a matter of fact, there are but 35,000 practitioners, men and women, in the whole of Britain. An officer of the Royal Army Medical Corps, who speaks with the authority of accurate official knowledge, has been at great pains to correct this absurd story. He has repeatedly stated that the alleged mortality of 60,000 is five times in excess of the actually number of medical officers in the entire British forces. The facts are that out of 12,000 officers, 195 have been killed, 707 wounded, and 62 died of wounds, a total of 964, so it would seem only about 2 per cent lost their lives. A glorious record indeed, quite equal to that of the other branches, but nothing to deter a real upstanding man from the adventure and especially a medical man.

Then we hear whispering of title, rank and such like. These are important, they imply knowledge, experience, ability and accomplishment in the office they cover. We had a serious lesson in this direction in the Spanish War when rank, without "experience, ability and accomplishment" of the particular kind attained by military medical officers, was bestowed.

Of course we all want to get on, and a cabin window route is attractive, but *noblesse oblige* and no man who has not specialized as a military medical officer can fully meet the obligations of one until he has so specialized. Rumor reaches us that in the distribution of rank the shoulder straps have gotten badly mixed and the leaf and the bar have fallen on the just and unjust alike. Even were this true, and it would be surprising were it not, things will adjust themselves when the trying-out process comes in the field. It is unnecessary to say that any distinction or title is but tinsel and fustian unless there is a real man behind it, with real knowledge of his work, real ability, a cheerful spirit of loyal patriotism and a self-sacrificing sense of duty. It

is true that some of the military titles already bestowed are retrospective, due to the prominence of the recipient or his eminence in an important specialty; but promotions when the army is actually in the field undoubtedly will be determined by efficiency.

"General," "Colonel," "Major" are empty names unless sustained by character, ability and experience to fulfil the true functions of an army officer in these offices, namely, zealously to obey the orders given him, at all times and places, to know and do military things and to get things done, in the sense of meeting emergencies, with capacity, sagacity, loyalty, courage, endurance and enthusiasm. High rank in the regular army implies a long period of service and a knowledge of military matters which is acquired by a long trying-out process. Unlike the poet, the officer is not born such; he is the product of aptitude, training and practice.

If there be any physicians who are hanging back from accepting commissions in the Medical Reserve for reasons of rank, or because they have some string tied to their acceptance, or because they do not want to serve in France, but desire "research work" safe at home, which we doubt, these would hardly make creditable officers. Were there such their situation would be like the episode in Mark Twain's story in which a dinner party could not go forward, the gangway being blocked because of an interminable dispute among the guests about degrees of "precedence." Artemus Ward's burlesque army which consisted solely of epauletted colonels was a standing joke of the Civil War. We shall not repeat that farce, nor spoil many of our newly acquired reserve officers by dubbing them with distinctions to which only long and devoted service would entitle them.

As to pay, it is to be borne in mind that the pay of a lieutenant, captain or major is higher in our service than for a corresponding grade in foreign armies, a matter of some importance and yet not everything. Hundreds of well-to-do Americans are rendering cheerful service in France in comparatively humble stations, men of wealth are driving motor ambulances, gentlewomen are attending to menial duties for the sick and wounded in the hospitals, some of the most eminent surgeons of the country are serving in base hospitals abroad at but a tithe of their former income. The professor of physiology in Harvard University, a lieutenant in the M. O. R. C., is devotedly attending patients in the wards of his base hospital in France. There are many such splendid examples of patriotism, and yet we fear if the medical profession generally does not awaken to a realizing sense that even more is required of it, it will be in a fair way to lose some of the credit and renown which it has gained in wars of the past and for its preparedness in this.

The Military Surgeon appeals to the younger members of the medical profession who, perhaps, are less concerned about titles and emolument, that they do their bit for their country by entering the Medical Reserve. What we need is not scientists and research workers, important as such are, but sturdy, able-bodied, capable, clear-headed young physicians who are willing to serve as regimental surgeons in France. Those who take this step will not fail of honor and recognition in their profession upon their return; they will have something not only for themselves but for their children and their children's children to look backward to with pride. The young men who go will be given duties and responsibilities which will make them more capable, enduring men, wll give them an unique experience, will bind them to their comrades with whom they share common danger, will gain for them the grateful appreciation of their fellow countrymen and ultimate large material reward, such as came to the soldier surgeons of the Civil War.

The lot of those who do not go may not be so enviable. "The least a stay-at-home traitor can look for," said General Grant, "is oblivion." It behooves the younger medical men of the country to set an example to the more mature and grasp the opportunity for service, of honor, which the country holds out to them. If we may borrow the language of an eminent Greek professor who was himself a soldier before he became a scholar, those who will have served their country best in this crisis and this campaign, "will live longest in song and legend, song as yet unsung, legend not yet crystallized."

SOME EFFECTS OF THE WAR ON THE MEDICAL PROFESSION

It is obvious that an affair of such magnitude as the present war, disrupting every class and avenue in life, must have a profound effect upon the medical profession as a whole and upon the individuals who compose it. Fortunately this effect seems almost wholly beneficial. To many, military service will open the gates of professional opportunity. Not a few medical men, whom finances or other matters have held in cramped environment, will rise through achievement in broad fields of endeavor they would otherwise not have known. Many whose educational facilities were restricted, will now have chances to perfect their clinical training in the wards of great hospitals and under the tutelage of medical officers who, in civil life, were great teachers and clinicians. The man of ability, dwarfed by environment, will have his chance to come to the front. Many a potential surgeon will have opportunity to learn by operative practice which would never have been afforded him in his civil practice. Many a shrewd diagnostician will prove his abilities and rise from obscurity to a high place in the respect of his

fellows before the war is over. Before military and naval forces are disbanded, many medical men of present average status will have moved up into the expert class. They will seek and utilize to the fullest the tremendous professional opportunities to "carry on."

Professionally, there will be opportunities to develop along certain lines to a degree impossible in civil life. While the field of practice is more restricted than that among citizens of all ages and sexes, yet the pathological conditions which will be found in the military service, will have such richness in number and variety as will make experts therein of those who take advantage of such opportunity. He who desires to specialize in any diseases, other than those of women and children, will doubtless have his chance. The ambitious and the able will rise to a new professional status.

To the profession as a whole, the throwing together of its representatives in a common uniform, for a common cause, cannot but bring about a mutual understanding and sympathy and weld it together in a way otherwise impossible. The general practitioner from the country and the city specialist, may find themselves tent mates. From north and south, east and west, the profession comes together in the great medical training camps and divisional cantonments and readjusts its ideas and estimates of each other and each other's standards. Each cannot but be broader and better through acquiring the other's viewpoint.

Military service necessarily implies much travel. Already the profession as a whole knows far more about this country than it did before responding to the call to arms. Soon it will go abroad to follow the flag to the diverse quarters of the world that destiny may dictate. It will be a pleasant, a thrilling and an instructive experience, and the profession as a whole will be better for it. It will make the individual broader, more tolerant, less self-centered and self-sufficient, from coming into rough, though cordial, contact with other classes in life and new surroundings.

Through experience gained in the management of government hospitals, many small civil hospitals will doubtless be developed, after the war, in communities whose doctors had not previously had the training and self-confidence necessary to their successful establishment.

Physically, military life will do much for the doctor. The regular hours and unbroken rest unobtainable in civil practice, hard exercise and systematic physical training, life in the open, abundance of good plain food at regular times, forced abstention from alcoholics—all these will do much to establish a strong physique and sound health that should add much to the expectation of life after the war is over.

As to the country at large, this will undergo a tremendous sanitary

uplift as a result of the war. Through service with troops, and familiarity there acquired with the modes of spread, and measures of repression, of the agencies of disease among them, very many thousands of medical officers will be transformed into potential civil health officers thoroughly well qualified in all matters relating to applied hygiene and sanitation. As these return to civil life, they will bring with them far higher sanitary ideals as well as far broader sanitary knowledge. They will win against the farmhouse without a privy, the well receiving the leachings of the farmyard, the filthy dairy, the fly-breeding compost heap, and other sanitary iniquities in which they have heretofore acquiesced. They will see no reason why civilian communities should not attain the same degrees of sanitary excellence as they themselves have seen brought about and maintained among troops. They will popularize antityphoid inoculation and thereby tremendously reduce typhoid incidence. If from the south, they will carry out in civil life such hookworm and antimalaria campaigns as they learned to wage in the army. They will completely alter their viewpoint toward numerous causes of disability that heretofore they have accepted unchallenged. They will in this way add so much to the life, health, efficiency and happiness of the nation as to go far toward repaying whatever the war may cost. E. L. M.

GOVERNMENT WAR RISK INSURANCE

After duty to our country the next thought is duty to our families. The fear that the dear ones would be inadequately provided for might, for the moment, even obscure the paramount right of the country. To relieve this situation Congress has made provision to insure every person commissioned, enlisted. enrolled, or drafted into active service in the military or naval forces of the United States, the policy covering disability or death and amounts from one to ten thousand dollars in multiples of five hundred.

The plan is not only wise and humane, but it is founded on good business principles, so good indeed that no soldier, whose family is not adequately provided for, can afford to ignore the offer.

Of course the Division of Military and Naval Insurance, Treasury Department, has published information covering details of the plan, so The Military Surgeon will only mention the salient features and incidentally urge the membership to insure as soon as possible, as the privilege to those now in the service will expire 120 days from date of assignment or enlistment.

The insurance is issued at monthy rates for the age (nearest birthday) of the insured, increasing annually, the increase being one cent monthly for each thousand dollars of insurance until past forty years when the increase grows gradually greater. At the age of thirty years

one must pay monthly 69 cents per thousand, or $6.90 for $10,000 of insurance.

The insurance, on this basis, may be continued for five years following the termination of the war, after which the premium will be the net rate according to the American Experience Table of Mortality and interest at 3½ per cent per annum. In case of total disability $5.75 monthly per thousand of insurance will be paid the insured for twenty years, or so much of that period as the disability continues.

The application for insurance has the effect of a request that the premium shall be deducted from the monthly pay, unless otherwise specifically stated. Any writing sufficiently identifying the applicant and specifying the amount of the insurance will be accepted, but this should be followed by a properly prepared blank, on request of the Bureau of War Risk Insurance, Washington, D. C., to which bureau application for insurance must be made directly, or through some authorized officer.

It is quite important that our members in active service should thoroughly inform themselves of all the details of this beneficent scheme, which they may do by writing to the bureau.

It might be asked if this plan of insurance, which is technically known as "Term Insurance," has any advantage over that offered by life-insurance companies. There appear to be several advantages. Primarily no one in active service or of draft age could obtain such insurance at anything short of prohibitive rates, if at all. We are told that the cost of hitherto existing policies is to be increased by $37.50 to $100 per annum for each thousand of insurance, an average of $68.75, for all military service outside our continental limits, and that not more than $5,000 of insurance of any kind can be taken out under the "War Clause."

Perhaps a hypothetical case would best illustrate the situation. A policy beginning at the age of 30 years would pay to the Government during the first five years of war an average of $8.52 per annum per thousand; a mutual company would charge in ordinary peace times $12.80 less a dividend of 25 per cent, $9.60, and a "non-participating" policy would cost $8.74. But in war time these companies, as stated, charge an average of 7 per cent additional, making the rate $62.10 and $78.74 respectively, approximately $70.00 per thousand more than the United States Government, the safest insurance company on earth, would furnish insurance to its soldiers.

Nor is this all. If at the termination of the war, say three years, the insured should desire to convert his term policy into straight life insurance, he may do so by paying annually to the Government the ordinary net premium per thousand, about $19.00, which excludes the overhead

charges, against about $20.00 per thousand demanded by insurance companies. But the government insurance continues without physical examination, while the companies would demand a very searching examination from one seeking insurance after the war. Then, too, in the event of permanent total disability the Government's policy matures, which is not always the case with an ordinary policy.

From the foregoing it appears that the essence of the proposition is, the Government assumes the cost of war risk and administration, guarantees against loss, and charges only the basic price of peace life insurance. Surely no wise man could afford to leave such an opportunity unavailed of.

OUR PURPOSE WIDENS

Not a few words of appreciation are due our colleagues of the Medical Officers' Training Camp at Fort Benjamin Harrison, for their whole-hearted welcome and generous hospitality. But even more we thank them for the realization of what the Association has stood for and the vision of what it is to be.

For more than a quarter of a century it has contended for the progressive ideas which found fruition in this camp. A great medico-military organization based upon high humanitarian ideals, broad concepts, fraternity of spirit, ability to appreciate and power to perform efficiently, without friction, the important work devolving upon it.

But now further opportunity opens. We find ourselves inevitably expanding, as well, into the great patriotic society of the medical profession in this war. We have become to the physician in uniform what the Society of the Cincinnati was to the officers of the Continentals, what the Loyal Legion is to the commanders of our Civil War. Our Association is based upon ideals national, indeed international, in scope, patriotic as well as professional; and it exists ready at hand, created by Act of Congress, as if for the very dual purpose which now devolves upon it.

Our members stand at the inner shrine of patriotism, as well as the front of medico-military knowledge, and we are bound more closely together than is possible in any other society of medical men. Besides the community of professional interest, the sole *raison* of other medical organizations, our Association is based upon the lofty spirit of patriotic service. But beyond this there is the tie indissoluble, the bond of battle, and we, who have together endured the dangers, the hardships, the sorrows and joys of a campaign, who have shared with each other our blanket and our crust, who have risked our lives for our fellows, will find in the Association the medium through which our friendships, and the memory of our common accomplishment, will be preserved for ourselves, our children and our children's children.

CURRENT LITERATURE

A Year's Experience of Eusol as a General Antiseptic in H. M. S. "Lion." Alexander Maclean, Fleet Surgeon, R. N., and Horace E. R. Stephens, Surgeon, R. N. *Journal of the Royal Naval Medical Service*, Vol. iii, No. 2, April, 1917, p. 163.

The paper is an eloquent tribute to the value of "eusol" as an antiseptic agent in the treatment of all septic wounds and affections *under thoughtful and judicious handling*.

Eusol had been in constant general use for a year, on board H. M. S. *Lion*, when this report was published, and employed in the treatment of every variety of wound. The wounds are divided into three groups, namely, (*a*) those that were brought into the sick bay after the accident occurred; (*b*) those in which pus and other visible signs of sepsis were evident; (*c*) those received in action on May 31.

Thirty-seven cases, under class (*a*), averaged four and a half days of sickness. Every wound was washed out freely with pure eusol, sutures were placed where required and a 1 in 2 eusol dressing applied. Every case healed by first intention. No sign of pus appeared in any case so treated!

Twenty-four cases, under class (*b*), averaged eleven days of sickness. It was noted that in these septic wounds the inflammation subsided after the treatment was begun.

Fifty-seven cases of wounds and burns, under class (*c*), were received during action. Eusol was the only antiseptic employed in dealing with wounds, many of which were treated without the preliminary cleansing with soap and water, a natural sequel of the limited time at the disposal of the surgeons on ships in action. The list of the fourteen cases, cited in the table, serve as an excellent illustration of the great value of eusol as an efficient antiseptic.

But our authors, in addition to wounds, have extended the eusol treatment to boils, abscesses, alveolar disease, tonsillitis, venereal sores. The routine treatment of abscesses consisted in free incisions and in the syringing out of the cavities with pure eusol every two or three hours. In cases of alveolar abscesses, eusol, even when diluted ten times, is considered to be a very efficient oral antiseptic, the foetor of the breath disappearing "as if by magic." In tonsillitis, the routine treatment consisted of a thorough swabbing of the fauces with pure ensol, combined with the constant use of a 1 in 10 mouth-wash. It was made a routine practice to swab the throats of all men joining the ship, and our authors attribute to this practice the comparative freedom from infectious diseases. The question, naturally, at once arises as to the possible effect of such routine treatment on carriers!

Contrary to the experience of others, Maclean and Stephens have never found eusol solution to cause pain, which, in their opinion, is an indication that too strong a solution or too much powder was used.

In the authors' opinion, it cannot be doubted "that HClO is one of the most formidable enemies of pathological microörganisms; that this characteristic quality is short lived; that, hence, they see the practical necessity of *repeated applications* in septic wounds, while in fresh wounds one thorough dose would suffice.

An important bearing on ship's hygiene is contained in the following paragraph of the article: "We believe that sepsis throughout the ship has undergone a marked decline. The healthy wounds, the small percentage of tonsillitis and sore throat, together with a relative immunity from the specific exanthemata, cannot be due to a mere coincidence. A great variety of diseases set in with an indefinite sore throat. We believe our practice of swabbing the throats of all men joining the ship, together with the application of eusol to cases of sore throat occurring on board, forms an important element in the prevention of infection."

The reviewer is involuntarily reminded of a paper entitled: "The Prevention of Infectious Diseases on Board Ship," *Journal of the Association of Military Surgeons*, 1904, in which the disinfection of throat and nose as well as that of the surface was observed to check the spread of several epidemics of measles.

The authors conclude that we now possess four distinct methods for attacking sepsis, namely: "(1) the solution of eusol, for open wounds and washing out cavities; (2) the powder eupad, for sloughs and very septic tissues; (3) the intravenous injection of eusol in saline for toxemias and septicemias; (4) eusolized vaccines which have just been introduced by Dean with promising results."

HENRY G. BEYER.

A Serious Case of "Frozen Foot" Cured by Active Hyperemia, Erminio Ghirlanda, Dott. *L'Ospedale Maggiore, Milano,* Anno iv, No. 12, December, 1916, p. 717.

The methods employed for the production of active hyperemia are many and varied. The author speaks, more especially, in favor of the hot-air method, according to which, air is heated by means of an alcohol lamp; saying that "with this system alone is it possible to obtain a strong hyperemia, and to carry the temperature to 100–120°, without damage to the organ." He attributes this property to the fact that dry air is a poor conductor of heat, possessing a minimum of heat-capacity. In apparatuses in which electricity is used as a heat-source, the air stagnates and such air cannot be tolerated for any length of time.

Owing to the author's extensive experience, he was called to the "Ospedale Territoriale" No. 3, of the Red Cross, in Via Arena, where he had an opportunity of treating 400 cases of frozen limbs of all degrees of severity. The one case which the author describes is certainly a remarkable one and illustrates the very great efficaciousness of the method. The apparatus of which the author makes use is the ordinary apparatus of Bier, but slightly modified, to make it more economical and of more practical use in hospitals, consisting of a simple wooden box with a zinc cylinder, a spirit lamp and a thermometer.

H. G. BEYER.

A Contribution to Antimeningococcic Serum Therapy, by Francesco Spirito, Dott., Tenente medico-capo riparto. *L'Ospedale Maggiora*, Milano, Anno iv, Serie ii, No. 12, p. 712.

Notwithstanding the fact that twelve years have gone by since the first experiments were made by Jochmann, of treating cerebrospinal meningitis by the injection of antimeningococcic serum into the spinal canal, there still remains a certain lack of unanimity among physicians with regard to the best method after which the serum ought to be administered. Since, moreover, this disease continues to appear, more or less mysteriously, but regularly, wherever overcrowding of men, especially young recruits, is temporarily unavoidable, every contribution to the subject of its treatment must be welcomed. Having had twenty-five cases under treatment in his hospital for infectious diseases, with results entirely satisfactory, the author, indeed, has excellent reasons for publishing these results as well as the methods of treatment by which they were obtained.

The author rejects as antiquated the old symptomatic treatment of the disease by blood letting, cupping, the local applications of tincture of iodine, the hot iron, mustard plasters and mercurial frictions; baths both warm and cold were not used; the ice-bladder to head and spine alone were occasionally used for the relief of headache. Much benefit for the patients is also said to have been derived from the subcutaneous administration of morphine. The principal treatment, however, consisted in lumbar puncture, followed by the injection of antimeningococcic serum, while the patient was sitting across the operating table, with his head and trunk bent well forward. As regards the amount of spinal fluid withdrawn, the author has limited it to that which issued spontaneously and without aspiration. In order to counteract any lowering of intracranial pressure, due to the escape of intraspinal fluid, the serum was injected immediately after the spinal fluid had been withdrawn.

In the different cases, the quantity of spinal fluid that escaped varied from a few centimeters to 40 c.c. on the first puncture; it also varied as regards transparency and, towards the end of the operation, it sometimes showed an admixture of blood. In such cases the flow was interrupted and serum injections were given immediately. The serum was introduced slowly and at a temperature of 37° C. in order to avoid a sudden increase in pressure. The injection of the serum is ordinarily painful, especially when the quantity of fluid injected is greater than that which was withdrawn. Shooting pains in the lower limbs, sometimes dizziness, temporary increase in the headache, sometimes culminating in unconsciousness, occasionally were noted. In two of the cases, the injection of the serum was followed by the involuntary discharge of urine and feces on the operating table. But such incidents are of a temporary character and cease to recur after the patient is replaced on his bed, his head lowered and his pelvis elevated.

The serum employed had been made in Milan, and some in Paris; no difference in therapeutic efficiency was noticed: the quantity injected, ordinarily, was 20 to 30 c.c., repeated daily or every other day; three or four injections were, generally, all that were necessary. The mortality was 30 per cent.

In conclusion, our author states:

1. Serum therapy is one of the best methods of treating cerebrospinal meningitis, but treatment must be begun as early as possible, after the diagnosis has been established.

2. Intraspinal treatment by the serum is, perhaps, more efficacious than treatment by subcutaneous injections, both with reference to mortality as with regard to later troubles.

3. The accidents complained of as accompanying intraspinal treatment are no more serious than those met with in hypodermatic treatment by the serum, while the former method possesses the advantage of carrying the serum into direct contact with the seat of the infection and the organisms causing the disease.

H. G. Beyer.

Le malattie per carenza (deficiency diseases), by G. Mosc. *L'Ospedale Maggiora*, Anno iv (Serie ii), No. 12, December 31, 1916, p. 735.

From the very comprehensive review with the above title, giving a detailed account of the present status of what is up to the present known on the subject of "deficiency diseases," a few points should be of special interest to the readers of The Military Surgeon at the present time.

Some time since, Weil and Mouriquand, in a series of studies, investigated, both experimentally and clinically, the diseases due to the absence in a certain diet, of ferments necessary for a normal nutrition. To these diseases they gave the name of "deficiency diseases" (*malattie per carenza;* from the Latin *carere*, being deprived of), thus differentiating them from the infections and the intoxications.

By far the most important discovery in the investigations that followed was that of the "vitamines" by C. Funk. Chemically, the substance now known as vitamine is a pyrimidine base, a constituent of nucleic acid, related to the purines and found generally in nutritive substances, but notably in the scaly cuticles of the seeds of certain cereals, the most diminutive quantities of which were found to correct the nutritional deficiencies in scurvy, beri-beri and even pellagra.

During the present war Weil and Mouriquand did not fail to discover among soldiers signs of, at least, the initial steps toward scurvy: pallor of the skin, loss of appetite, intestinal disturbances, bleeding from the gums, etc.

It is well known that sterilization and prolonged conservation of vegetables leave them deprived of their antiscorbutic potency. Fruit acids, while not in themselves antiscorbutic, seem nevertheless to contribute to the preservation of antiscorbutic ferments, in that, for instance, lemon juice, boiled, and the cooking of other vegetables, in the presence of acids, do not lose their antiscorbutic properties. Meats ought not to be overdone by cooking; meats, moreover, when cooked and canned, must be considered as deprived of their vitamines; refrigeration preserves the antiscorbutic power of meats. Wine is, likewise, considered an antiscorbutic!

The composition of "war bread" deserves some attention in this connection: white bread, made with flour (*burratata*) up to 70 per cent, is an excellent

bread for those having access, at the same time, to meats, fresh legumens, but insufficient for troops in the field, often of necessity exposed to a uniform and monotonous dietary. Dark bread under such conditions would be preferable. Holst and Frohlich witnessed the beginning of an epidemic of beri-beri in Norwegian sailors, when white bread was substituted for rye bread. Little speaks of the frequent occurrence of beri-beri in Labrador, where the people live exclusively on white bread, and Magendie saw a dog that had survived on a diet of brown bread, die on being fed on white bread

Graham bread, therefore, would seem to be preferable; but this bread is not tolerated by man, notwithstanding the completeness in its composition. Men, unlike birds, are unable to digest cellulose. An addition of 10 per cent of unmilled rice to dark bread would answer both to the chemical as well as the biological requirements put on a good and wholesome bread.

Summary in Brief.—Beri-beri is due, not alone to the consumption of highly milled rice but also to the decortication of all the other cereals and legumens. Sterilization produces the same effects on them as does milling.

There is a close relationship existing between beri-beri and scurvy. These diseases are not caused by simple inanition, nor by a too uniform and monotonous diet; they are due to the absence of a chemical substance necessary for the assimilation and the utilization of all nutritive substances, and which is contained in the cuticles of cereals and legumens as well as in fruits and meats, when fresh.

All excessive sterilization of milk is to be avoided. The purification by sterilization of canned goods by certain industrial establishments makes it necessary that vitamines or vitamine-containing food-substances must be added to a diet, in order to supply their deficiency in food-stuffs treated in the above manner.

H. G. Beyer.

Microscopic Studies on Frozen Subjects. A Contribution to the Pathogenesis of Freezing, by G. Tizzoni, tenente colonello medico, and G. de Angelis, tenente medico.

Although frozen feet and hands, in soldiers in the field, have been noted to occur in previous wars, in not one of them have they attracted the attention of surgeons to the same degree that they have in the present. The microscopic studies of Tizzoni and de Angelis on the various tissues involved in the different degrees of lesions, caused by temperatures oscillating around the zero point, accompanied, as they are, by a review of the literature on the subject, are a very timely addition to our knowledge of these conditions, intended, as they are, to furnish us with a better understanding of their nature and of the measures to be employed for preventing and treating them.

It was fairly well known that the local effects of cold upon living tissues depend not alone on low temperatures and the time of their activity, but also on the particular refrigerating agent itself and as to whether it acted in a dry or moist environment, in still air or in an atmosphere in motion. While, then, much was already known with regard to the character, course and final results

of the injurious influences of low temperatures on living tissues, little or nothing was known with regard to the special lesions in the different tissues themselves.

Previous experiments had been made on the ears and lips of rabbits and on the tails of mice and rats; the lesions were artificially produced by different refrigerating mixtures, cold metallic plates, ether sprays or liquid air. But in none of such experiments could the conditions be considered identical with those under which such injuries occurred in man. Interesting experiments are on record by Cohnheim, Kriege, Pictel, Rischpler, Marchand, Zoege v. Manteuffel, Uschinsky, Benndorf and Kraske, Fuerel and others.

Tizzoni and de Angelis, after a careful microscopic study of three cases of frozen parts in man, recognize the existence of great differences between the results produced in experiments on laboratory animals and the results of freezing as they actually occur in man; the former seem to be more the direct results of cold on the tissues, the latter, much more, the consequences of an ischemia.

The conception prevailing up to the present may be summed up in the following words: Dry cold produces its destructive effects, directly, on the tissues and vessels exposed to it; while low temperatures, accompanied by humidity, act chiefly on the vascular constituents of the exposed tissues, causing first arterial contraction, then dilatation, slowness of circulation, stasis, thrombosis, followed by secondary degenerative processes in the tissues, ending in the total destruction and in gangrene of the affected parts.

Tizzoni and de Angelis found, with perhaps the exception of sympathetic nerve fibers, that the other nerve fibers had remained normal; they attach great importance to their findings of lesions in the coats of the arteries, especially in the elastic tissue, which, in time, entirely disappears and leaves an empty space, showing but a somewhat thickened intima; the same degenerative process extends to and affects the muscular tunic of the arteries; the corresponding portion of the intima appears tumefied and thickened and richer in nuclei, ending in blocking the lumen of the vessels; nothing abnormal was noticed in the adventitia.

Greater still were the changes observed in the veins; their walls were found to be infiltrated and tumefied, their lumina almost abolished; sometimes the accumulation of fluid between the different coats of the vessels caused the partial detachment of the intima, which then caused a partial obstruction in the vessel.

Next to the blood-vessels, the greatest changes were observed to have occurred in the striated muscular fibers, which had lost their striation, their nuclei, their connective tissue sheaths forming a homogeneous mass; in other places their appearances were merely such as to remind the observer of caryolysis; even here nuclei were no longer distinguishable; the neighboring connective tissue showed the presence of leucocytes in moderate amount. These appearances are looked upon by Tizzoni and de Angelis as indicating a true ischemic necrosis; they are not to be taken as signs of an inflammation but rather as symptomatic of destruction. The tissues, besides the blood-vessels, and the muscular tissues show little or no chance in structure.

From a consideration of the above-cited microscopical findings, our authors conclude that the exposure to cold with humidity determines lesions in the

arterial walls consisting, first, in a swelling of the elastica, leading to a rapid destruction; hence the loss of tonicity, the rapid lowering of arterial pressure and the slackening of the circulation, all of which dominate the entire process and lead to a deficient nutrition of the parts affected, ending in necrosis. At the same time, general symptoms which accompany the ensuing gangrene must be attributed to the absorption of toxic substances coming from the destroyed tissues.

Treatment is to be preventive as well as curative. Well-fitting, impermeable shoe-gear, the abolition of leg bandages, shorter periods of standing position, avoidance of anything obstructing or impairing the normal circulation in legs and feet, are some of the preventive measures to be recommended and to be carried out.

The chief object in the treatment of frozen parts is the prevention of gangrene. Tizzoni and de Angelis recommend that all such patients should be referred to a special hospital. Friction with snow is beneficial; it tends to cause vascular contractions and to restore normal circulation in the parts not already destroyed. Multiple incisions might prove beneficial if they were to relieve simple mechanical impediments to the circulation; they would be dangerous when made into tissues of lowered vitality and hasten the advent of gangrene, hence should be altogether avoided.

The rational treatment, in view of the above-described microscopical data, should be calculated to restore the destroyed balance between arterial and venous pressures, facilitating the flow in the veins and encouraging the local arterial afflux of arterial blood and exciting normal contractibility; in other words, any means should be employed to restore the normal circulation in the parts not yet destroyed and amenable to such treatment. Our authors recommend the administration of adrenaline, paragangline, thyroidine, strychnine, etc., but especially the latter, on account of the promptness of its effects.

Therapeutic treatment, therefore, is summed up in (1) cold frictions; (2) protection of parts from infection and the maintenance in them of normal temperature; (3) elevated position of the limbs, to favor the venous outflow, and (4) the prompt administration of strychnia, thyroidine, adrenaline, etc., for the restoration of the normal arterial pressure in the frozen parts.

The authors incline strongly to a conservative attitude as regards amputations, recommending that the gangrenous portions should be left to eliminate themselves spontaneously.

H. G. Beyer.

The Sterilization of Malarial Patients with Quininized Normal Serum by Intravenous Injections, by Dr. Ferdinand Barbary. *Bulletin de L'Academie de Medicin,* No. 18, Seance du 1er Mai, 1917, p. 570.

It appears that in 1916 "the XVe region" was charged with the hospitalization of the sick of the expeditionary corps of the Orient; from the Dardanelles at first, from Salonika later. From the thirtieth of June, 1916, to the thirty-first of March, 1917 the auxiliary hospital 28 at Nice received 1,022 sick, of which 123 had received injuries and 899 were malarial.

After trying the old method during the first six months, of administering quinine by the mouth with unsatisfactory and discouraging results, the method of intravenous injections was resorted to. Barbary injects 125 c.c. of physiological serum, containing in solution 0.50 g. of basic quinine hydrochlorate and 1 g. of urethane. These injections are given every three days in the beginning, later every five days. The water must be distilled and filtered; the sodium chloride and the quinine chemically pure; the injections are made into the veins of the forearm or elbow; patient must lie down during, as well as fifteen minutes after, the introduction of the solution.

Results: fever is stopped rapidly and recovery begins at once; the chances of malaria spreading by carriers greatly diminished.

H. G. Beyer.

Prophylaxis and Treatment of Frozen Parts, by Cesare Rabbi, capitano medico. *Giornale di Medicina Militare,* Anno lxv, February, 1917, Fasc. ii, p. 146.

The author reports the results of his treatment of frozen feet with *Norwegian Tar* and gives the histories of a number of cases showing satisfactory recoveries. He spreads the tar, after warming it slightly to make it flow more easily, over the surfaces affected, covers them with a layer of cotton and a bandage; the dressings are renewed every other day. Pains and tumefaction rapidly disappear, gangrenous parts slough off, the odor disappears and healthy granulations close the places deprived of their normal skin covering.

No general symptoms, due to a possible absorption of chemical substances contained in the tar, were ever noted.

H. G. Beyer.

Practical Clinical Notes on Surgical Work at the Front, during the First Six Months, by Ignazio Collica, capitano medico di complemente, chirurgo primario del Columbus Hospital di New York. *Giornale di Medicina Militare,* Anno lxv, 28 February, 1917, Fasc. ii, p. 120.

In his very interesting paper, the author gives us an account of the surgical work done by him in the Italian Field Hospital 085, in the war zone, during the first six months from the time it was open to patients. The number of patients admitted to the hospital, between April 1 and September 30, 1916, was 4,031; that referred to the surgical wards, under his direction, was 2,575. Out of this number of cases, he reports in detail only those presenting the most serious injuries and which remained in the hospital until they had either completely recovered, or were transferred to other hospitals, already on the way of recovery.

We find here the detailed clinical histories of 14 craniotomy cases, 12 spinal injuries, in some of which laminectomy and suture of the cord were done, 18 thoracic injuries involving internal organs, 36 abdominal injuries, 4 cases of appendicitis, 16 cases of severe injuries of the extremities, and 4 cases in which amputations became necessary. We must limit ourselves to giving here but a condensed abstract of two of the cases.

1. B. Pietro, infantryman, admitted April 14, in a state of profound shock, with a perforating gunshot wound over the left parieto-frontal region. From

the anterior opening, blood, intermingled with brain substance, protruded. After disinfection, ice was placed over the injured parts. After recovery from shock, complete aphasia with complete hemiplegia on the right half of the body became apparent. The case progressing normally, surgical intervention was abstained from, in order to eliminate the results of possible indirect effects of the trauma on the patient's condition. But when on the seventh day, to the symptoms already noted, there were added pain at the seat of injury and high temperature, craniotomy under ether was performed: the partly broken portion of the skull-bone was removed, the opening enlarged, a large collection of blood, mixed with bony spicules and shreds of cerebral substance, both white and grey, from within and without the dura were evacuated. A light pluck of iodoform gauze was placed into the large residual cavity. At this time no pulsation of the brain could be discerned. On the day following, the fever disappeared, never to return; the pains gradually diminished. At the second dressing, pulsation on the part of the brain had returned and the pains were less intense; a small quantity of sero-sanguinolent fluid had accumulated. The size of the gauze-pluck was gradually reduced until, at the sixth dressing, the place of injury was simply covered up. The cavity of the wound gradually closed, the external wound cicatrized, improvement progressed steadily.

From the third day onward, after the operation, movements in the lower limbs began to reappear; those in the arms came on much more slowly and were not completely restored, even at the time our patient left the hospital. A return of the power of speech seemed, at first, improbable. But, by daily and persistent exercise, the patient gradually learned to pronounce letters and, after three weeks, entire words were spoken by him, until at last he was able to read aloud. When discharged, on May 17, his wound had all but completely healed and the power of speech, although still slightly labored, was completely regained.

From his experience with the fourteen cases of surgical intervention in head injuries, under the trying conditions of a field hospital, the author considers himself entitled to formulate the following conclusions:

1. That all such injuries, without exception or distinction, should be turned over to the surgeon, because, even in the most desperate cases, surgical treatment may meet with success.

2. That early intervention is of vital importance in order to combat as soon as possible the intracranial consequences of the trauma and to reduce or even altogether prevent the chances of the occurrence of sepsis, the greatest of all (and always invincible) of the dangers of brain injuries.

3. The author's detailed account of the case of the infantryman, C. Pasquale, whose spinal cord had been severed transversely by a shrapnel bullet, between the sixth and eighth dorsal vertebrae, with considerable loss of substance, and in which case, after bilateral laminectomy, the author brought the two ends of the cord together by sutures, including the pia, although attended by but partial success, "quoad functionem," is not only a most remarkable contribution to successful spinal surgery, but shows, also, that the professional medical devotion to our poor wounded in the field has not yet become altogether legendary.

G. H. Beyer.

BOOK REVIEWS

Muskets and Medicine or Army Life in the Sixties, by Charles Benculyn Johnson, M.D. Philadelphia: F. A. Davis Co.

The experience of the author as a private, hospital attendant, and hospital steward in the 160th Illinois Volunteer Infantry, from August, 1862, to September, 1865, is told in simple fashion, interspersed with amusing anecdotes and historical facts and dates of operations in the Civil War.

Like many other young men of that period he turned back from the plow, "left it sticking in the furrow," to enlist, and on the return of peace continued the medical studies which he had begun when accidentally detailed for duty in his regimental hospital.

Of the comrades to whom the book is dedicated, comparatively few remain, but it will interest the survivors and the descendants of veterans, while the contrasts noted in the military and medical methods of the "60's" with those of the present day cannot fail to encourage those serving in our army of 1917.

George Andrews.

Therapeutics, Materia Medica and Pharmacy. The Special Therapeutics of Diseases and Symptoms, The Physiological and Therapeutical Actions of Drugs, The Modern Materia Medica, Official and Practical Pharmacy, Prescription Writing, and Antidotal and Antagonistic Treatment of Poisoning. By Saml. O. L. Potter, A.M., M.D., M.R.C.P. Lond. Thirteenth edition, revised and enlarged by Elmer H. Funk, M.D. Philadelphia: P. Blakiston's Sons & Co.

Potter's Therapeutics has been for many years one of the very best on the subject printed in the English language. The arrangement is excellent, the matter is full and complete, yet treated in a clear and concise manner.

The present—thirteenth—edition is edited by Dr. Funk, of the Jefferson Medical College, who has thoroughly revised it to conform with the ninth edition of the United States Pharmacopoeia.

Every practitioner and student should have a copy of this valuable book, which has set the standard for nearly thirty years.

Chas. F. Mason.

Some Personal Recollections of Dr. Janeway, by James Bayar Clark, M.D. New York: G. P. Putnam's Sons, 1917.

The name of Edward Gamaliel Janeway, during his long and useful professional career, meant the very highest development of diagnostic skill and acumen, not only in this country but throughout the world, and this sketch of the great physician, regrettably short and incomplete as it is, conveys some idea of the fine qualities, the strength of character and the charming personality of a man, of whom his country and his profession were justly proud.

Dr. Clark's long and intimate association with the subject of his sketch well fits him to write an appreciation of his great associate. The sketch, though very brief, is charmingly and sympathetically written and gives some indication of the personality of a man known to most of us only as a great diagnostician.

It is to be hoped that Dr. Clark will at some future time write a complete biography of the man who combined his great professional knowledge and skill with the highest ideals and ethical standards. No one could be better fitted than Dr. Clark to write such a biography, and a study of the life of this great physician should be an inspiration to students of medicine, and might help to elevate the profession and steer it away from the commercialism now said to be threatening it.

WM. H. ARTHUR.

FIRST AID AND EMERGENCY TREATMENT. A text-book of first aid and emergency treatment. By A. C. Burnham, M.D., Medical Corps, U. S. R., Instructor in Surgery in the Polyclinic Hospital, New York City; Attending Surgeon, Department of Surgery, Vanderbilt Clinic, College of Physicians, New York City. Philadelphia and New York: Lea & Febinger.

This is the latest of the books on first aid and emergency treatment. There are no specially new features in form, arrangement, or contents. It is about as good as any of its predecessors, but no better.

CHAS. F. MASON.

THE TREATMENT OF EMERGENCIES, by Hubley R. Owens, M.D. 12mo, 350 pages, 249 illustrations. Philadelphia: W. B. Saunders Co., 1917. Cloth, $2.00.

Fractures, Wounds, Haemorrhage, Sprains and Dislocations, Burns and Scalds, Asphyxiation, Drowning, Convulsions, Unconsciousness, Antiseptics, Bandaging, Transportation, Poisons and their Treatment are included in the chapter headings and there is a very good index. The book is well made and shows the effect of careful proofreading.

The author states that this book is essentially an enlargement of his lectures to the policemen and firemen of Philadelphia, and to the nurses in two of the city hospitals. The book is distinctly different from many books on first aid written for laymen, in that an endeavor has been made to give general underlying principles and reasons for applying the different methods of treatment, on the principle that "unless a person wishes to become well versed in the treatment of emergencies, it would be wise not to take the subject at all."

The reviewer believes the author is right. Students taught in first aid should be trained to think and act in accordance with surgical principles, rather than to simply apply a dressing in a mechanical way in accordance with some rule. And since the art of thinking can hardly be presumed to be a monopoly of the medical profession, it is reasonable to suppose that the layman may think on the subject of first aid if only the facts be presented to him in simple non-technical language.

The author seems to have succeeded admirably in presenting the subject in an interesting way in simple language. The book is profusely illustrated so that all important dressings and methods are plainly shown. Unfortunately from the military standpoint, the treatment of injuries received in war has received little attention. It is true that several pages are devoted to gunshot wounds, but shrapnel, hand grenade and shell wounds are not discussed, and while the first-aid packet is described on page 70, most of the dressings and

methods shown are such as require roller bandages and other appliances seldom found in the field.

But while the book is not written primarily for the military service, it contains many things that would be useful to an instructor in first aid in the Army, and could very properly be used as an adjunct to other works dealing more especially with the injuries received in war. As a book of instruction for policemen and firemen, for whom it was especially intended, it should be a success, and would be a good book for any intelligent layman who wishes to study the subject. E. B. Vedder.

Review of "Pathogenic Microörganisms," by William Hallock Park and Anna Wessels Williams. Sixth edition. Philadelphia: Lea and Febiger.

This, the sixth edition of the well known text-book on pathogenic microörganisms, by Park and Williams, has been quite largely rewritten, and considerable new matter has been added which will prove of value to the laboratory worker and student. The arrangement of the work is convenient, except that, to the reviewer, it would be better to give the general discussion of the protozoa at the beginning of the section dealing with that subject, rather than with the general discussion of the bacteria, and this same criticism is true of the methods of protozoölogical research, which are separated from the section describing the special organisms belonging to the protozoa. While discussing this subject, it may be stated that the section of the book dealing with the protozoa, while a fairly good general résumé of the subject, is disappointing when one comes to look for detailed descriptions of the protozoa associated with disease in man. For instance, it is doubtful if any one, unless an expert, could diagnose the different species of malaria plasmodia, or the two species of endamoebae, occurring in man, from the very general descriptions given, and the same is true of most of the protozoa described. It is also unfortunate that, in a text-book which is used in many of our best medical schools, statements are made throwing doubt upon the existence of two such well-known species of endamoebae as *Endamoeba histolytica* and *Endamoeba coli*, and the relation of the former to dysentery. If there is one question that may be considered to be settled in protozoölogy it is the existence of these two definite species of endamoebae, and one who hesitates to accept them would be as well justified in not accepting almost any of the well-known bacterial or protozoal species. The experiments of Walker have settled, for all time, the relation of these species to disease, and the objections mentioned to the results of his work are, to say the least, of little scientific value, and it is surprising that they are allowed to appear in a scientific work which is to be placed in the hands of students of medicine. The reviewer has yet to see a book devoted primarily to bacteriology, but in which a section upon the protozoa is incorporated, that does justice to the latter subject, and it is his belief that the combination of the two subjects in our text-books upon bacteriology is a great mistake. The part devoted to the protozoa is always limited. and none of the sections devoted to this subject that the reviewer has read in any of our works upon bacteriology are much more than quiz compends and do less than justice to a very important subject. The section on protozoa

in this work is much better than in other works of similar pretensions but, even here, it is sketchy and far from an adequate discussion of the subject.

The chapters in the book devoted to a general discussion of the bacteria, the methods of cultivating and staining them, and to immunity, are most excellent and contain much more matter than do similar chapters in other text-books. A curious error occurs on page 210 regarding the bacterial suspension for macroscopic agglutinations. If the dilution of the culture is made as recommended, the suspension cannot be used owing to the extreme dilution. The chapters describing the different species of bacteria are also very full and excellent, although more space might have been given to such important bacteria as *Bacillus welchii*, the bacillus of leprosy, and the bacillus of plague.

The chapter upon the practical application of bacterial vaccines is a valuable addition to the work and contains much that will prove of interest to the general practitioner. A curious error is noted regarding the dosage of the army typhoid vaccine. The statement is made that "The army men receive 500 million, 1 billion, and 10 billion." As a matter of fact, the dosage of the army vaccine has always been 500 million for the first dose and 1,000 million for both the second and third doses. It is to be hoped that this very important error will be corrected in the next edition.

There is a good discussion of the serum treatment of lobar pneumonia, in the light of recent researches, and also of the serum treatment of meningitis, and the discussion of the use of diphtheria antitoxin in treatment and immunization is excellent.

The chapters relating to the bacteriological examination of water and milk, of shell-fish, and the destruction of bacteria by chemicals are all good, as is the chapter upon practical disinfection and sterilization. All in all, the book is a valuable and up-to-date treatise upon bacteriology and contains much material that will be found missing from some other text-books upon the subject.

CHAS. F. CRAIG.

A TREATISE ON ORTHOPEDIC SURGERY, by Royal Whitman, M.D., M.R.C.S., Eng., F.A.C.S., etc. Fifth edition. Revised and enlarged. Illustrated by 704 engravings. Philadelphia and New York: Lea and Febiger, 1917. $6.50.

A book of 900 pages, divided into 24 chapters. A recognized standard work on the subject of orthopedic surgery, in its fifth edition, needing no further recommendation. To the military surgeon, especially under present conditions, it may prove disappointing to find "Military Orthopedics" treated of in one short chapter (XXIV). The student of the subject, however, will soon realize that his disappointment is only apparent and that a conscientious perusal of the book will soon enable him to specialize in the treatment of war-injuries, notably fractures, requiring special care and treatment with the principal object in view of preventing deformities. H. G. BEYER.

REPRINTS AND TRANSLATIONS

THE MEDICAL SERVICE AND HOSPITALS OF THE BELGIAN ARMY[1]

(Concluded)

(With ten illustrations)

THE ORGANIZATION OF ARMY HOSPITALS

DURING the last fortnight of October, 1914, after the evacuation of the coast of Flanders, the mass of Belgian wounded was directed towards Dunkirk and Calais. Dunkirk was both a fortified town and a port. Uncertainty as to the future made it dangerous for the wounded to remain long at the fortress, and all who could be moved were sent on to Calais.

The medical staff found itself up against the greatest difficulties. Everything was lacking; all the Belgian hospitals had ceased to exist and even the barest necessaries could not be found for emergency hospitals. The French and the Belgian doctors could only renew the dressings at the railway stations. The four military hospitals at Calais were nearly full. The wounded who could be moved were taken to the harbor by any chance means of transport and put on boats sailing for England and Cherbourg. Between October 23 and 31, 10,834 were thus evacuated by 20 transports.

For the wounded who could not be moved and the dangerously sick the creation of ambulances became an urgent necessity. First of all, on October 17, two private clinics, one dispensary and a few beds in the almshouse for old men were occupied. Shortly afterwards the machinery repairing sheds at the Calais railway station were dismantled and turned into a temporary evacuating hospital. On the eighteenth five ambulances were opened: two on the ships *Paris* and *Ella* (600 beds), one in the convent of the Little Sisters of the Poor (24 beds), one at the citadel, one at the Salons Richelieu (59 beds). In the latter all departments were housed in one great hall. The wounded were heaped up there: gangrene and tetanus cases could not be isolated. Dressings, immediate operations, even administrative work—all were carried on in this one room.

But the Battle of the Yser began. The influx of wounded grew greater day by day; new quarters were hardly prepared for them before they were immediately overcrowded. The wounded at the Salons Richelieu were obliged to wait in the street until their turn came for dressings, and sheltered, meanwhile, in the Cathedral of Notre Dame

[1] Translation transmitted by a Military Observer.

which is situated just opposite. On the eighteenth and nineteenth eight new ambulances were organized (170 beds); on the twenty-second another (177 beds), on the twenty-fourth four; on the twenty-fifth two. In spite of this rapid increase and although the transport service by sea was frequent and regular (500 wounded were evacuated on the twenty-third, 1,400 on the twenty-fourth, 1,200 on the twenty-fifth, more than 2,100 on the twenty-seventh), the hospitalization capacity of Calais still remained insufficient. Seven more ambulances were opened. Most of these were in school buildings, graciously placed at the disposal of the Medical Service by the municipality or by some religious congregation; among them were two evangelical churches, some large unoccupied warehouses and a factory.

These numerous emergency hospitals enabled the work to meet the most urgent needs. The wounded were sheltered, it is true, but under what conditions? The greater number were at first lying on the bare ground, afterwards on straw. This state of things, however, was soon improved. Some of the inhabitants generously lent their mattresses; the French military authorities placed 700 beds and mattresses at the disposal of the Belgian wounded. The old folk at the almshouse of the Little Sisters of the Poor gave up their beds; the same was done by the Franciscan Sisters. On board the *Paris* and *Ella* beds were arranged one above the other in two and even three rows. The British Red Cross, First Aid Nursing Yeomanry and Belgian Hospital Fund all helped to improve these conditions by their repeated gifts.

Drugs, especially antiseptics and material for dressings, were often altogether lacking. The doctors had no instruments at their disposal but those in their hand-bags; the operating room at the ambulance of the Franciscan Sisters, more happy than most, possessed one box of instruments called the "Congo Box." Nourishment was insufficient. Many hospitals were fed at the beginning by the charity of the population.

The same charitable welcome awaited the Belgian wounded at Dunkirk. But the total number of beds was only 2,000. The main endeavor of the medical corps was to get the wounded into such a condition as to enable them to endure the crossing to Cherbourg, Southampton or Folkestone, from whence they could finally be sent to the numerous hospitals created by French and English benevolence.

In the month that followed the Battle of the Yser recourse again had to be made to evacuation into the United Kingdom, as the influx of wounded exceeded the receptive capacity of the Calais hospitals. In November there were again 3,379 evacuations; in December 1,639; in January 2,869; in February, 2,448; in March, 2,030. These were the

last. The total number of wounded sent to the United Kingdom may be estimated at 28,000. By November 30, 1915, 20,776 of these had returned, of whom 550 were officers.

From January, 1915, the French Government had placed at the disposal of the Belgian authorities the hospitals of the Tenth Region, whose center is Rennes. During the first quarter of the year 1915, concurrently with the evacuation of 7,347 wounded to England, 11,792 were sent into the Tenth Region. Since April transportation was entirely by rail in this district; the total number of evacuations for the first three-quarters of the year 1915 was 27,304. As things now stand, and unless something unexpected should occur, these organizations are sufficient.

On leaving the divisional hospital the dangerously wounded are sent to first line hospitals; the sick and lightly wounded go on to evacuation hospitals.

Hitherto it was an axiom that surgical intervention on the battlefield presented so many risks that it was not to be thought of. It could only be permitted quite in the rear, where aseptic technique could be rigidly observed.

The fixed character of military operations modified this, in the sense that it permitted the establishment of hospitals in contact with the forces actually engaged in fighting. Distances were diminished and at the same time delays were lessened by the employment of motor cars. The time lost before surgical intervention could be brought to bear upon wounds was reduced to a minimum. A soldier who had perforation of the bowels could be operated upon three hours after he was wounded; another shot in the arm at 1 p. m. could be sent from the very front line 20 kilometers to the rear, amputated and his wound dressed at 6 p. m.

Four hospitals of this kind are now at work in the army zone. The first in point of time was the Belgian field hospital, which, since the beginning of the Battle of the Yser, was established at Furnes in the buildings of the Episcopal College. At first exclusively served by a staff and surgeons from the United Kingdom, this hospital was afterwards placed under Belgian military medical direction. Since the bombardment of Furnes it was transferred to Hoogstade. Its normal capacity is 100 beds.

In November, 1914, the Belgian Red Cross established at La Panne a second hospital, which was directed by the surgeon Dr. Depage. The Ocean Hotel was its nucleus; vast barracks were added, bringing the number of beds up to 800. Built and equipped at the expense of the Red Cross, its working expenses are defrayed by the War Budget.

At the end of April, 1915, a third hospital was opened near Adinkerque under the name of "Cabour's Hospital," from the name of the owner of the little hunting lodge round which are grouped the barracks that constitute the hospital premises. It enabled the government to close a temporary hospital created on November 6 in the Rue du Fort Louis at Dunkirk, on the site of an ambulance founded by the Union of French Women. The outfit was completed by gifts: a completely equipped operating room (Mr. Evan Thomas), a sterilizing room (American Ambulance), and X-ray room (Mme. Curie). Major surgery could thus be carried on here. This hospital remained open until April 29, the day of the second bombardment of Dunkirk. One hundred and eighty-eight had been treated there. Cabour's hospital is situated on a picturesque spot, amidst the partly wooded inner line of downs. The pavilions are of the "Lazaret" or quarantine station type of the Belgian Medical Service; 16 pavilions of 30 beds each are provided for patients; the others are used for general purposes and for accessories. Each lazaret was built and furnished in two days by a gang of workmen. Finally, at the beginning of August, 1915, a fourth hospital, built like Cabour's on the quarantine pavilion plan, was established at Bourbourg near the Dunkirk railway line. The surgical staff of these two hospitals is entirely composed of medical officers of the Belgian Army.

These hospitals have all kinds of comforts and every scientific and modern improvement: operating room, sterilizing room, complete outfit of surgical instruments and materials, X-ray, research laboratory, etc. The doctors and surgical specialists here undertake all operations to the same extent and with the same success as in permanent hospitals in large cities. Their situation in these healthy spots, the free currents of air and light, the harmonious interplay of various departments, make of these temporary hospitals model organizations.

HOSPITALS OF THE CALAIS BASE

As soon as the diminution in number of sick and wounded rendered it possible, the general organization of the hospitals was pushed forward with method and celerity. Three principal objects were pursued; the practical improvement of the hospitals, the specialization of the different departments, and the constitution of a reserve of beds. Before the present situation was actually attained many modifications foreign to the realization of these desiderata undoubtedly hindered their progress.

There were, in January, 1915, 28 ambulances actively at work. The British Army made a naval base at Calais, the Belgian authorities handed over to it the Casino de la Plage and the huge premises of

the Pension Berthelot. Ten schools were also given up to its use. Finally, to clear the docks necessitated the departure from the harbor of the ships *Ella* and *Paris*. The Mechanics' Institute was evacuated for the reinstallation of the workshops. Thus resources were diminished by about a third. This was remedied by the creation at the port of Gravelines of a hospital of quarantine barges containing 500 beds, and by the establishment of an ambulance of 150 beds at Calais-Vireval.

In rearranging the hospitals, metal beds, furnished partly by the Service of Supply and partly by the Belgian Hospital Fund, gradually replaced the sacks of straw and the pallet-beds. Comfortable furniture adorned the rooms; baths were installed and cloak-rooms contrived. Adequate sterilizing plant insured the rapid disinfection of clothing.

On January 1, 1916, the situation was as follows: the 18 hospitals and ambulances have a capacity of 1,800 beds. They are divided into hospitals for major or for minor surgery and hospitals for contagious diseases. Ocular, cutaneous and venereal affections are attended by specialists.

The Elizabeth Hospital, installed through the generous initiative of the French Society for Helping Wounded Soldiers, deserves special mention. It has a capacity of 110 beds, is endowed with the most modern and perfect equipment, and has received since its inception on March 1, 1916, more than 1,500 sick and wounded. The laboratory installed by the Duke of Vendôme has produced more than 4,000 radiographic photographs.

A bacteriological laboratory was installed at Calais in January, 1915, and lent its help to the hygienists at the front. A total of 2,316 analyses were made.

The military hospital at the Porte de Gravelines is composed of 36 pavilions and has all the equipment necessary for war surgery, an ophthalmic institute, a department for venereal diseases and scabies (itch), and a service of plastic surgery and prothesis for wounds of the jaw and face. The ground where it was established was still unturned soil in the early days of September. On November 15 it was completed and ready to receive patients.

The Army Central Pharmacy, installed on board the mail-boat *City of Liège*, was sufficient for all needs; parcels were even sent periodically to civilian doctors and to public functionaries in the part of the territory not invaded. A laboratory of chemical research and analysis was created; an important reserve store of instruments for surgery, dentistry, ophthalmology, radiography, electrotherapy, bacteriology, sterilization, disinfection, chemistry and pharmacy was

collected. It was at the Central Pharmacy that, on the very day of the first attack by asphyxiating gas, the liquid that moistened the mask protector captured on a prisoner was analyzed. A few days later the Belgian Army was presented with an excellent mask for use against the gas employed at that period.

It would be tedious to describe in detail all the different base hospitals. Suffice it to say that the number of beds always kept free enables the authorities to cope with even the most trying circumstances, and that the evacuation service, equally by land or by sea, is so ordered that the base hospitals will never be overfilled by any sudden rush of wounded.

Hospitals	*Capacity*	*Object*
Salons Richelieu	59	Internal complaints
Little Sisters of the Poor	24	Internal complaints
Industrial Institute	118–368	Internal complaints
Middleton Factories	25	Internal complaints
Lamarck School	96	Internal complaints
Bon Génie	66	Contagious diseases
Pension St. Pierre	177–388	Contagious diseases
Château Dubreucq	45	Contagious diseases
Anglo-Belgian	166	Contagious diseases
Franciscan Sisters	61–103	Surgical cases
Rue des Prairies	42	Surgical cases
Ecole St. Emile	39	Mental diseases
Municipal Nursery	35	Nervous affections and cerebro-spinal meningitis
Rue des Soupirants	83	Laryngology
Elizabeth	110	Major surgery
Calais-Virval	150–764	Major surgery
Porte de Gravelines	504	Major surgery

There exists besides, in relatively close proximity to Calais, five hospitals established at Petit Fort Philippe, Guemps, Recques sur Cours, Neuville and Valloire, of which the total capacity is about 850 beds.

ESTABLISHMENTS IN THE INTERIOR OF FRANCE

For self-evident reasons, and profiting by the experience of 1914, the military authorities did not think it wise to keep in the neighborhood of Calais the sick and wounded who were receiving treatment. Hence resulted the organization of hospitals in the Tenth Region, the center of which is Rennes; 5,000 beds distributed among 31 hospitals were placed at the disposal of the Belgian soldiers, at such a distance from the field of battle as to be unaffected by any change of events. The Tenth Region answered this purpose excellently, situated as it is

about 600 km. from Flanders. The Belgian Medical Service has completed its installations by opening special hospitals for convalescents with mental troubles, nervous affections, tuberculosis, etc.; with a total of 2,100 beds.

But the withdrawal of the hospitals from the front necessitated some organization suitable for the transportation of the wounded. The hospital train has solved the problem. Some trains go from Adinkerque to the Calais base; others leave for the very heart of Brittany. Between Adinkerque and Calais eight assorted trains are put into motion according to the necessities of the moment. Each train is composed of six carriages for lying-down cases, two corridor carriages for sitting cases, and four vans, one of which is the kitchen. The carriages for the lying-down cases are of a special type. The Belgian Government ordered 250 of these to be constructed. The benches and partitions are movable. Immediately upon mobilization they were put at the disposal of the Medical Service and were instantly fitted out with a view to their new usefulness. The scheme of Colonel Simonis permits the loading of eighteen stretchers in each carriage, in groups of three, one above the other.

Nine trains for lying-down and four for sitting cases carry out the evacuation from Calais towards the interior of France. Two trains are always ready at Calais for field service and two for the service of the interior. The rolling stock comprises 200 corridor carriages, each with a carrying capacity of 18 lying-down cases. The staff is composed of 367 ambulance men and a sufficient number of doctors and chemists. They assume the care of the sick during the journey and the repair and disinfection of all the materials. The trains which evacuate from the front carry 250 portions of food, of broth, tea, wine, brandy, etc. Those which run from Calais to the interior, covering a journey of 700 or 900 kms. carry 500 portions of food and, besides the ordinary stimulants, eggs and condensed milk.

This organization has produced the best results and reduced to a minimum the inconvenience of long journeys. The Belgian Army has placed it at the disposal of the Allies who fight in the neighboring sections of our front. Since November 1, 1914, the date at which it was first definitely in working order, until March 1, 1916, 117,347 sick and wounded, of whom 28,651 were French, 33 English, 248 German, 620 civilians, were thus transported in 828 trips from the evacuation hospitals to Calais, and from Calais to the hospitals of the interior.

The French hospitals placed at the disposal of the Belgian Army were supplemented by others devoted to special kinds of cases. They were as follows: Hôpital Juaye-Mondaye for nervous affections;

Hôpital d'Auberville for internal diseases; the Hospital Cauvalet and Montpellier for chest and lung cases. In order to enable convalescents to benefit by the milder climate of the south two hospitals were opened on the Mediterranean coast, one at Cap Ferrat, the other, thanks to the generosity of the Duke and Duchess of Vendôme, at Cannes. In the interior convalescent depots were also established for soldiers where health demanded a somewhat prolonged rest.

The soldiers from the Calais hospitals stay after recovery at the Camp du Ruchard or in the ancient Abbeys of Valloire, Fontgombault and Ligugé, at the sanatorium of Cap Ferrat or else, if their convalescence is of short duration, in a divisionary depot. Typhoid fever convalescents are isolated in the Abbey of Neuville until they cease to be germ-carriers. Fifteen other depots of this sort have been organized in the Tenth Region.

The number of sick treated in the depots of the interior up to December 31, 1915, was 29,808; 21, 317 were sent back to the army. The number of these passing through divisionary depots during the same period was 87,693 of which 70,551 have rejoined the army.

HOSPITALS OF THE UNITED KINGDOM OF GREAT BRITAIN

At the beginning all the Belgian evacuated were scattered throughout the length and breadth of the kingdom and, in the haste of the moment, no record of their destinations was kept. A deputation of Belgian doctors arrived in November and had for its task to seek out and reunite the evacuated and to arrange for their return to the continent. They had recourse in the first instance to the Salvation Army, which was most useful at the beginning of the war owing to the facility of its transportation and its network of branches. The deputation next set to work to found Belgian hospitals. Three of these, established in London under the general name of King Albert's Hospital, opened, one after the other, in December, 1914, and January and February, 1915. The first was at Staffordshire House, Store Street, thanks to the generosity of Messrs. Bourne and Hollingworth. The others are the property of municipal corporations placed under the authority of the local Government Board. The number of beds was about 1,300. In addition, two Belgian ambulances existing at Folkestone since November 5, 1914, were attached to this organization. Two depots were also opened at St. Anne's Home, Carrington House, Courtfield Gardens, Buckingham Palace Gardens; others were started outside London, notably at Bournemouth, Hanwell, Bromley, Wellingborough, Cheltenham; Brotherton Hall. A sanatorium for tuberculosis was opened at Eastleigh.

The return of Belgian soldiers to the Continent was organized concurrently with these arrangments for the sick and wounded. The numbers were: 6,423 in November and December, 1914; 2,956 in January, 1915; 2,560 in February; 2,992 in March; 1,768 in April; 1,005 in May; 1,090 in June; 564 in July; 420 in August; 479 in September; 255 in October; 254 in November; 74 in December. Total, 20,840. In February, 1916, there remained 567 sick and wounded under treatment. 5,749 were discharged and 230 died.

INSTITUTES AND SCHOOLS FOR DISABLED SOLDIERS

The Belgian Army Medical Corps has not limited its task to the simple treatment of war wounds and to the restoration of general health to the wounded. It has successfully endeavored to do more and better. Already towards the middle of November, 1914, there was in the rear a large mass of soldiers so mutilated by wounds of nerves, joints or bones as to be rendered unfit for return to active service. Were these unhappy creatures to be wrecks forever, and was it necessary to wait until the end of the war in order to care for them properly? Would not science then find itself face to face with conditions rendered irremediable by delay?

After careful examination it was possible to divide the wounded into two categories, each of which demanded quite different treatment.

Numerous were those whose condition required a supplementary operation or treatment to combat the sad consequences of their wounds; partial or complete ankylosis; scar retraction; muscular atrophy; tendon or nerve lesions; late or vicious union. Among these cases were a certain number in which the lesions or functional weakness appeared to be chronic and whom it would be inhuman to abandon to their fate, discharging them without trying rational treatment or without finding for them some means of livelihood.

For the convalescents in the first category it seemed to us that a carefully applied physiotherapic treatment would give them back, wholly or partly, their capacity for work and would enable many among them to take their place in the line of usefulness; for others the treatment might reduce to a minimum their functional weakness. In the second category were those suffering for some functional weakness, entire or partial, that appeared to be chronic and it seemed to us to be equally necessary for us to concern ourselves actively about them so that they could either be employed in the army auxiliary service or be introduced to such trades as might render them of some social value in the future.

There is certainly no doubt that the pensions or indemnities that they will receive after the war will be insufficient to enable them to live and that, if no care is taken of them, they will fall into idleness and become a public charge and heavy expense to the country. It is, besides, necessary that a large number of men able to carry on economic industries should be given back to the country. But the experience of those who have especially occupied themselves with the

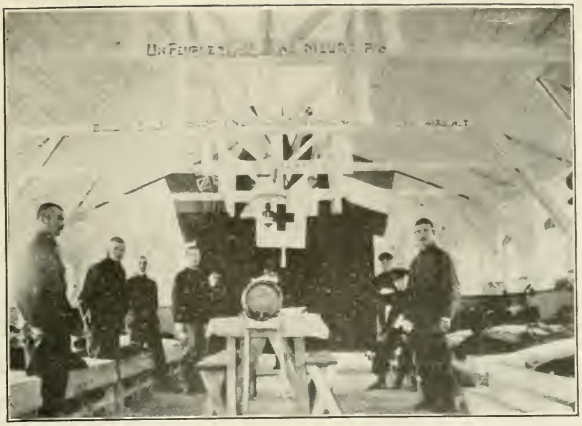
industrial education of the crippled enables us to affirm that 80 per cent of these, even when seriously injured, can regain either wholly or in part their economic value as workers. Of this 80 per cent, 45 per cent are actually able entirely to earn their own living after re-education in their former trade or in a trade suited to their physical or intellectual powers; the remaining 35 per cent can only regain some part, more or less important, of their former value.

The problem of the medical and social treatment of our seriously injured presented itself to our eyes in all its fullness, demanding an immediate solution, full consideration being given to details of time, place and the resources at our disposal. The duty incumbent upon the Medical Service and the State consisted, on the one hand, in the installation of a hospital where all physiotherapic and orthopedic cases might be concentrated so that to those capable of even partial cure some functional readaptation, more or less complete, might be secured and, on the other hand, in the creation of schools for professional re-education and of an agency to help war-cripples and those in danger of becoming permanently crippled or disabled after having exhausted all therapeutic means of winning back their lost powers. Should those two bodies, medical and social, be united or be independent?

It is very difficult to determine the moment when improvement is no longer to be secured by physiotherapic means; it has been demonstrated that professional re-education can often favorably modify the functional weakness of certain kinds of cripples who have exhausted all therapeutic resources; in most cases it is a valuable help to treatment and helps in no small degree to hasten recovery. It seemed, therefore, logical to unite in the same place and under one sole direction the physiotherapic institute and the school of re-education; to place side by side these two organizations which should complete each other, undoubtedly constituted an ideal which it was impossible to realize at Rouen at the already distant period when we began to exert ourselves to ameliorate the lot of our war cripples. How indeed might so complex an organization for the medical and social treatment of these poor derelicts be established, far from home, with the feeble resources, in the midst of circumstances which presupposed no stability either in men or in materials? (Dr. Delentre, The Anglo-Belgian Hospital.)

The earliest efforts were directed towards the most pressing needs. On December 23, 1914, the Anglo-Belgian Hospital, Albert I, was opened by the Minister of the War in the buildings of the Trade School of Rouen. Its name recalled the generous and disinterested intervention of the Anglo-French Committee of the British Red Cross. At first it comprised about 50 or 60 beds; three months later this number was raised to 350; one year later two annexes established at Orrival and St. Aubien-lez-Elbeuf brought the figure up to 950. The buildings now in course of construction at Bon Secours will shortly increase this housing capacity by 1,200 units.

At the same time the scientific means employed to restore to the mutilated their capacity for work or to reduce to a minimum their



Divisionary Infirmary.

Room in a Divisionary Infirmary.

(To face page 640.)

First-Aid Post of the First Line.

First-Aid Post.

Construction of "Lararets."

Hoogstade Hospital, Main Entrance.

Hoogstade Hospital, General View.

Room in a Divisionary Infirmary.

Dressing Slightly Wounded Cases.

Disinfection by Spray.

functional weakness were gradually collected together into orthopedic and physiotherapic establishments. These include mechanotherapy (the apparatus for which, being difficult to procure, was often made by the cripples themselves) thermotherapy, radiology, electrotherapy and medical gymnastics.

Surgical intervention and prothesis are also included in the workshops annexed to the hospital the patients themselves have made, first, legs moulded in leather, then more perfect legs equal to the model known as the "American leg;" they also undertake to make leather arms and arms able to move and work.

Two thousand nine hundred convalescents have been admitted to the Anglo-Belgian Hospital during ten months. One thousand one hundred and seventy, or about 40 per cent, have rejoined the army.

As to the social problem, it has been solved by the Society for Assisting Discharged Soldiers, at Havre and the Institutes of Vernon and Mortain. The office of this Society at Havre was at first just a home, organized by M. Schollaert, President of the Chamber of Representatives, where soldiers definitely incapable of active service might receive shelter, food and medical care. But after a time it was discovered that amongst those who had received certificates of discharge there were many who were able to render some service to the state and to practice a trade.

The medical service of the Society tried at first to ameliorate the condition of those who were originally said to be incurable and in the end not recognized as such. Mechanotherapic establishments were, therefore, developed and completed. Workshops and courses for professional re-education were next added to the Institute. At first this was sufficient to meet the most imperative needs but it was not so when the discharged soldiers who had been in the United Kingdom were gradually repatriated.

In June, 1915, the Minister of War decided to organize a new establishment for re-education, which was installed at Port Villez (Vernon). The works opened on July 12; on August 21 a first contingent of 50 men arrived at Vernon. By January 15, 1916, this number had risen to 950. Forty-two trades are taught at the Institute for Professional Re-education. The following list gives an idea of their variety: *A. Wood work.* Hand and machine joinery, carpentry, cabinet making, turning, fancy goods, cane making, wood carving. *B. Iron work.* Iron fitting, casting, turning. *C. Leather work.* Shoemaking, harness and saddle-making. *D. Stone work.* Masonry, stone-cutting, bevelling, carving and other kinds of stone-work. *E. Industrial drawing.* Caligraphy, painting on glass, engraving artistic painting, painting in imitation of wood and marble, sign painting, scenery paint-

ing. *F. Typography.* Tenotype, lithography, printing, industrial photography, photo-engraving, bookbinding. *G. Basket work.* Coarse and fine. *H. Cutting out of Clothing.* Furs, and tanning of rabbit-skins, leather-dressing, glove making. *I. Upholstery and house decoration. J. Brush-making. K. Industrial electricity. L. Civil construction. M. Mechanical Heating. N. Hair-dressing. O. Motor technique.* Driving of motor cars and camions. *P. Alimentary trades.* Bakery, butchery, pork butchery. *Q. Agricultural and Horticultural trades.* Rearing of small stock. Finally, at the beginning of 1916, a model farm has been added to the establishment.

Re-education in intellectual work has been carried out concurrently with that for manual work. A school founded at Mortain prepares war victims for important administrative work: railways, post and telegraph services, indirect taxes, registration, customs, banks, provincial and communal services. The embryo of this school was a commercial department where book-keeping, commercial arithmetic elocution, geography, commercial correspondence, shorthand and type-writing were taught. Little by little it is growing and at the present day includes a technical course on telegraphy, for which the materials have kindly been lent by the French Government, and a course on industrial chemistry.

To sum up, the medical and hospital services of the Belgian Army have, since the Battle of the Yser, dealt with about 70,000 patients. Their usefulness can best be appreciated if we consider the small proportion of deaths caused by sickness, in fact only 2 per cent of the sick and two in every 10,000 of the present effective force in December, 1915. One hundred and eighty-four citations in the "Ordre du Jour de l'Armée" have been given in recognition of services rendered by the medical staff, chaplains and stretcher-bearers of the army. Their constant care has nullified the estimates of the Germans.

In spite of the unfavorable circumstances of the early and middle phases of the war, in spite of the very considerable superiority in material enjoyed by the enemy, and the advantages which enabled him to secure a foothold in Belgium, in spite of the withdrawal of nearly the whole of the national resources, the Belgian Army is far from being a victim of the annihilation that was said to have overwhelmed her in November, 1914.

Better still, in spite of the days when, passing through Liège, the German reinforcements announced with hurrahs the complete destruction of the foe with whom they had had to deal ever since the outbreak of the war, the Belgian Army today occupies a front double the length of that which stemmed the tide of German advance in October, 1914.

CLINICAL NOTES

EPIDEMIC CEREBROSPINAL MENINGITIS—REPORT OF THE FIRST CASE AT THE CONCENTRATION CAMP, FORT OGLETHORPE, GEORGIA[1]

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and
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THE following preliminary report concerns the data of the first case of epidemic cerebrospinal meningitis occurring at the Concentration Camp, Fort Oglethorpe, Georgia. Whether this is to be an epidemic or not and will show its harvest of cases remains to be seen. This case is considered of sufficient importance to report, since the same experience is likely to be encountered at other camps.

In brief, the clinical history is as follows. The patient, a private attached to the 56th Infantry, was 18 years of age and in the service two months. He had been a farmer residing in Tennessee. His previous medical history was unimportant.

History of Present Illness.—On June 10, 1917, the patient complained of swimming of the head accompanied by pains in his eyes and extreme nervousness. This continued for three days, when his nervousness had increased to a high state of excitability. He was unable to hold his hands still and presented jerky and spasmodic movements of the entire body. For several days he had complained of cough.

He was admitted to the Post Hospital, June 13, 1917, at 3 p. m., with the symptoms enumerated and intensified. He was extremely nervous, pupils dilated, skin cold, and an irritability which increased markedly when spoken to. His temperature was 100.5° F., pulse 102, and respiration 30. His physical examination showed a well-developed and nourished male with pupils dilated, optic disc margins blurred, and tongue coated with a thick, white scum.

His chest on the right side presented good resonance with vesicular breathing. On the left, in the axilla, dullness with bronchial breathing was elicited. Moist râles were heard toward the base on this side. His abdomen was held very stiffly so that palpitation was impossible. The reflexes could not be determined with any certainty because of the excitability.

On June 14, 1917, the patient was delirious and had a convulsion at 10 a. m. This was followed by unconsciousness which increased in

[1]From the Laboratory of the Base Hospital, Fort Oglethorpe, Georgia.

depth. At this time he was voiding involuntarily and vomiting. The knee jerk on the right was slightly increased and absent on the left. Ankle clonus was present on the left with an irregular Babinski on both sides. Koenig's sign was positive.

A spinal puncture was made at 4 p. m. and 10 c.c. of clear fluid under pressure were obtained. A centrifuge specimen of this showed a few small diplococci intracellular and definitely encapsulated. The cells were few in number and lymphocytic in type. His blood pressure was systolic 130 mm. The blood counts showed 29,200 leucocytes. Differential count, 90 per cent polymorphonuclear neutrophiles, 4 per cent transitionals, 3 per cent large monos and 3 per cent small monos. The diagnosis of epidemic cerebrospinal meningitis was held tentatively at this time.

On June 15, 1917, the patient was considerably worse. His temperature was 101.4° F., pulse 144, and respiration 40. The urine was straw-colored, acid in reaction, cloudy sediment, negative for albumen, sugar, acetone casts and positive for indican.

At 11 a. m., 3 c. c. of fluid was obtained, which was now cloudy, contained a few pus cells, large numbers of bacteria decolorized by Gram, and several cells showing one or more groups of diplococci within their protoplasm. A positive diagnosis of epidemic meningitis was made and at 3 p. m. 40 c.c. of cloudy fluid was withdrawn under pressure and 50 c.c. of anti-meningococcic serum introduced. Upon examination the fluid was very cloudy and contained many pus cells. The organisms were still few in number but definitely encapsulated and here and there intracellular. Cultures were made on plain agar and blood serum. At the end of twenty-four hours there was no growth on the agar and no clearly visible growth on the serum. At the end of forty-eight hours the agar was still negative, while the serum showed a very small pin-point moist growth. Microscopically this was a pure culture of cocci arranged singly, in pairs, and a few in chains.

The patient continued to grow worse and died at 8 p. m. with a temperature of 105.4° F., pulse 160, and respiration 60.

AUTOPSY PROTOCOL

Private, attached to 56th Infantry. *Chief diagnosis.*—Epidemic cerebrospinal meningitis. *Bacteriological diagnosis.*—Meningococcus intracellularis. *Gross morbid diagnosis.*—Cause of death—meningitis and pneumonia. *Heart*—Hypertrophy; acute parenchymatous myocarditis; right dilation. *Lungs*—Healed tuberculosis; broncho-pneumonia; hypostatic congestion and edema. *Liver*—Healed tuberculosis; acute parenchymatous hepatitis; passive congestion. *Spleen*—Healed tuberculosis; supernumerary spleen; acute follicular splenitis.

Stomach—Chronic toxic gastritis. *Brain*—Acute exudative meningitis (epidemic).

The general description follows:

The body is that of an adult male, 6 feet tall, weighs about 152 pounds, a recent vaccination scar on the arm. The rigor mortis is marked and the liver extends well up anteriorly. The hair is brown and the eyes blue. The pupils are equal and dilated. The mouth is moist and the teeth are covered with sordes. Preliminary incision reveals a well-developed musculature with a moderate panniculous. The pericardium contains 15 c.c. of clear fluid and no adhesions. In the heart the coronary vessels are engorged. The epicardium is smooth, glistening, and free from plaques. The left ventricular wall is slightly thickened. Upon section the muscle bundles are pallid and retain their striations with a slight degree of interstitial fibrosis. The valve leaflets are normal and the orifices hold their normal relationships as to size, with a relative dilatation on the right.

The apex of the left lung has one or two small nodules of healed tuberculosis. The upper and lower lobes are full of large and irregular tuberculosis, which upon section are raised above the surface and are granular. These sink in water. The lung is generally dark blue in color and exudes a large amount of frothy, blood-tinged fluid. The right lung is crepitant throughout, except for several healed calcified nodules, especially at the root.

The abdominal cavity is moist but contains no clear fluid. The liver is dark in color with pale yellow mottlings. He has a small, healed, calcified area similar to that in the lungs. The cut surface is mottled with yellow and nutmeg in appearance. The gall bladder contains 20 c.c. of dark brown bile. The gall ducts are patulous.

The spleen is slightly enlarged, soft, and dark blue in color. On section the follicles are very prominent. There are several calcified nodules. One small supernumerary spleen showed prominent follicles. The pancreas is swollen, reddish-pink in color, and the lobular markings are poorly defined.

The left suprarenal is slightly enlarged and upon section the medulla is soft with a hemorrhagic material exuding. The right suprarenal is smaller, firmer, and one portion of the cortex has a goodly amount of calcification, presumably an old tuberculosis process.

Both kidneys are swollen, blue in color, the capsules are slightly adherent, the cut edges bulge and the cortices are swollen. The blood vessels present a bluish lineation.

The urinary bladder contains a dark brown urine and the wall is reddened toward the trigone.

The stomach contains a brownish material. The wall is thickened and the rugae easily flattened out. The mucosa shows extensive congestion with much bile stain. In the intestines the mucosa shows the same reddening with much granularity. It is bile stained above with a large amount of mucus.

The meninges are reddened and have lost their glistening appearance, although there is no actual exudate present. The fluid is extremely cloudy, slightly blood-tinged and in excess. The larger vessels of the pia are highly

engorged and the smaller vessels make a fine reticular web from which the blood is not easily expressed. In the ventricles the fluid is cloudy, the choroidal plexus is deeply injected, but no pus is present.

DISCUSSION

In view of the facts that this is the first case of epidemic meningitis occurring at this camp, that there will probably be others in the future, and that it is present in localities from which large numbers of recruits are to be received, this case is deemed worthy of report. The virulence of this particular case and the somewhat atypical form of the etiological organism are very important. That this is the meningococcus there can be doubt, since it is a diplococcus in the free state encapulated, occurring intracellularly but difficult to culture, growing in single and chain forms, and decolorized by Gram's method.

Further studies are being carried on with culture, other cases, animal inoculation and agglutination, results of which will be furnished at the termination of the work.

CONCLUSION

1. This report contains the data of the first case of intracellular meningococcic cerebrospinal meningitis.

2. Clinically, the case presents all the signs and symptoms of a meningitis.

3. Bacteriologically, the etiological organism is a diplococcus encapulated, difficult to culture and decolorized by Gram.

4. Pathologically, the autopsy showed an early congestive and exudative cerebrospinal inflammation, with cloudy fluid.

REPORT OF SEVEN CASES OF EPIDEMIC MENINGITIS[2]

By First Lieut. JAMES D. BLEVINS, *M. O. R. C., U. S. Army.*

Case 1.—White, male, aged 18 years. Admitted to the hospital June 13, 1917. Present Illness: Began June 10, 1917, with pain and swimming in the head and eyes. On admission complained of headache, was very nervous and when spoken to or when he would move about he would tremble all over. At times was very cloudy mentally. Examination showed dilated pupils, reaction to light very slow, skin very cold and clammy, and abdominal muscles held very rigid. A few hours later had a convulsion, became unconscious, had involuntary urination, projectile vomiting, left knee jerk gone and right only slightly present. Spinal puncture showed clear fluid but a few hours later obtained very turbid fluid which contained diplococcus intracellulari. Introduced 30 c.c. of antimeningitic serum. Patient lived only four hours after the introduction of the serum.

[2] Base Hospital, Port Oglethorpe, Ga., June 1 to September 1, 1917.

Case 2.—White, male, aged 18 years. Admitted to hospital June 15, 1917. Present Illness: Began June 11, 1917, with headache and pain down the spine. On admission was delirious, had nausea and vomiting. Examination showed rigidity of neck, Kernig and Babinski present. Patient continually turning in bed. Temperature 103°, pulse 92, respirations 32. Did a spinal puncture, obtaining very cloudy fluid containing gram negative diplococci. I then introduced 25 c.c. of antimeningitic serum by force as it would not run in by gravity. After the first dose the others were introduced by the gravity method. I introduced 30 c.c. of antimeningitic serum into the spinal canal after withdrawing as much spinal fluid as came away under increased pressure for three successive days, after which time patient had no further symptoms than a very marked opisthotonus. This remained for about seven days coming on about the fifth day of the disease. Patient was returned to duty later with no untoward symptoms.

Case 3.—White, male, aged 22 years. Admitted to hospital July 4, 1917. Present Illness: Began July 3, 1917, with diarrhoea, headache and pain in back. Today had a chill and on admission complained of headache, pain in back. Examination showed some rigidity of neck, no positive Kernig, slight enlargement of spleen. Twenty-four hours later complained of some pain in back and headache. Now has increased rigidity of neck and slight Kernig. Temperature 103°, pulse 88, respiration 20. Spinal puncture showed very cloudy spinal fluid and a gram positive diplococcus, but later the smear from nose showed a gram negative diplococcus. Introduced 25 c.c. of antimeningitic serum, which was repeated the next day. Later patient was returned to duty.

Case 4.—White, male, aged 18 years. Admitted to hospital July 16, 1917. Present Illness: Began with a chilly feeling, nausea, vomiting, headache and fever. On admission patient was very stupid, would not talk and when moved it seemed to give him pain. Had some rigidity of neck and slight Kernig. Spinal fluid showed diplococcus to be present. Introduced 30 c.c. of antimeningitic serum which was repeated the next two days. The delirium cleared up the second day after the serum was first given. On the fourth day of the disease he developed opisthotonus, but it soon disappeared and patient was returned to duty with no untoward symptoms.

Case 5.—White, male, aged 18 years. Admitted to hospital July 22, 1917. Present Illness: Began July 21, 1917, with a chill, headache, pain in the back and fever. On admission was very delirious, pupils dilated, knee-jerks gone, Kernig and rigid neck. Temperature 102°. Spinal fluid very cloudy and under greatly increased pressure. Found diplococcus intracellulari present. Introduced 28 c.c. of antimeningitic serum, which was repeated the next day. Patient showed such marked improvement that no more serum was given. On the fourth day of the disease he developed a very marked opisthotonus which cleared up in a few days. Patient was soon returned to duty.

Case 6.—White, male, aged 18 years. Admitted to the hospital July 26, 1917. Present Illness: Was not able to obtain, as patient was very delirious on admission and tossed from side to side in bed and cried out as if in pain. Had a very peculiar cough, projectile vomiting and would not respond when spoken

to. Gave him ether and did a spinal puncture and obtained very cloudy fluid containing diplococcus intracellulari. Introduced 30 c.c. of antimeningitic serum, which was repeated the next two days. On the third day of the disease he developed opisthotonus which was of a very slight degree and cleared up in a few days. Patient made a very rapid recovery and was later returned to duty.

Case 7.—White, male, aged 22 years. Admitted to hospital August 22, 1917. Present Illness: Began August 19, 1917, with a chill, followed by headache, backache and fever. The headache was very severe and frontal in type. On admission complained of severe headache, backache and general malaise. Examination showed moderate prostration. Was very drowsy and had to be awakened after each question. Slight rigidity of neck; slight Kernig. Did a spinal puncture, obtaining turbid fluid which contained gram negative diplococcus. Introduced about 29 c.c. of antimeningitic serum, which was repeated for the next two days. Patient has marked improvement with only slight rigidity of neck, but is not yet ready to be discharged.

I have used both Mulford's and Park Davis' serum in the above cases and the results have been so excellent that I felt these cases should be reported.

REPORT ON MENINGITIS "CARRIERS" AND "CONTACTS" AT FORT ETHAN ALLEN, VERMONT, JUNE 4 TO 11, 1917

By Major EDWARD K. DUNHAM

Medical Officers' Reserve Corps, U. S. Army

The object of the visit to the fort was to study the personnel who had been associated with those subsequently taken sick with cerebrospinal meningitis.

The method employed for this purpose was as follows: Swabs were taken from the vault of the pharynx with the aid of a West tube, and streak plates of glucose-agar-sheep serum were immediately made. These were transported in a warm container to the research laboratory situated in the Vermont University Medical School, Burlington. At the laboratory, these plates were incubated at 37° C. until the next morning. They were then examined and slant cultures made from suspected colonies of the meningococcus. Subsequently, from these subcultures, agglutination tests were made with immune serum.

The first case of meningitis (Rawley) occurred May 28, 1917, in the First Recruit Barracks and was immediately removed to the isolation ward of the hospital. Those who slept near him in the barracks were Blake, Carr, Raymond, Lane, Smith and Larson. Of these, Carr and Lane were shown to carry the meningococcus in the vault of the pharynx on both June 4 and June 6. No meningococci were found in

the others, but all except two revealed the presence of Gram-negative diplococci, which were not the meningococcus.

The second case (Stein), 9th Recruit Company, Troop B, was taken sick in his tent, June 6, 1917, and cultures were made from his tent-mates Lovelace, Ferlito, Clark, Smith, Johnson, Paulson and Randall, on June 7. The meningococcus was demonstrated only in cultures from Clark made June 7 and June 8.

The attendants in the isolation ward were Edwards and Currano; of these, Edwards alone yielded meningococci on June 4 and June 6.

Treatment.—The nose was sprayed with an oil solution of dichloramine-T (toluene-p-sulphondichloramine) prepared as follows:

A 10 per cent solution of the dichloramine in chlorinated eucalyptol was diluted with 4 volumes of chlorinated paraffin oil. This solution, which contained 2 per cent of the dichloramine, was sprayed with an albolene atomizer into each nostril, employing from ten to twelve compressions of the bulb. This treatment was repeated at intervals of two hours, either three or four times daily. Treatment was begun on the first group of contacts on June 7, and on the second group on June 8. Daily plate cultures made from the pharynx, subsequent to treatment, in no case revealed the presence of viable meningococci. The personnel of the first group were returned to their quarters on Sunday, June 10, and those of the second group on Monday, June 11.

Dr. Edward Taylor, in charge of the research laboratory, and his assistant devoted all their time and the facilities of the laboratory to the prosecution of this work, and the essential aid given by them is hereby acknowledged.

The culture media, immune serum and much apparatus were furnished by the Rockefeller Institute. Without this support, the work would have been impossible, as the laboratory at the fort was not adequately equipped for work of this character.

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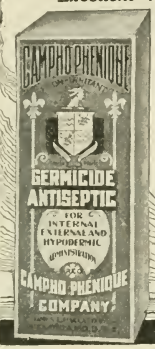

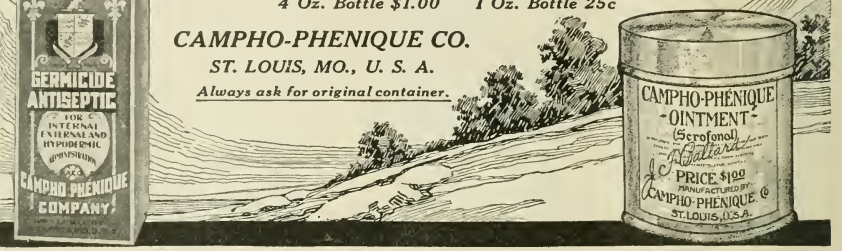

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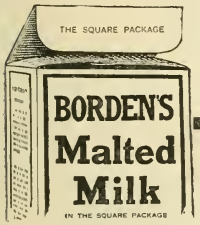

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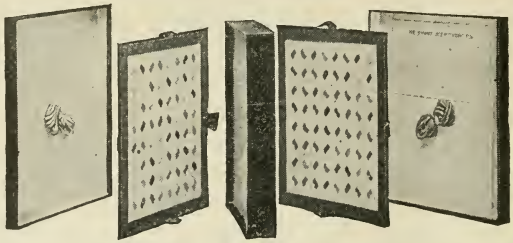

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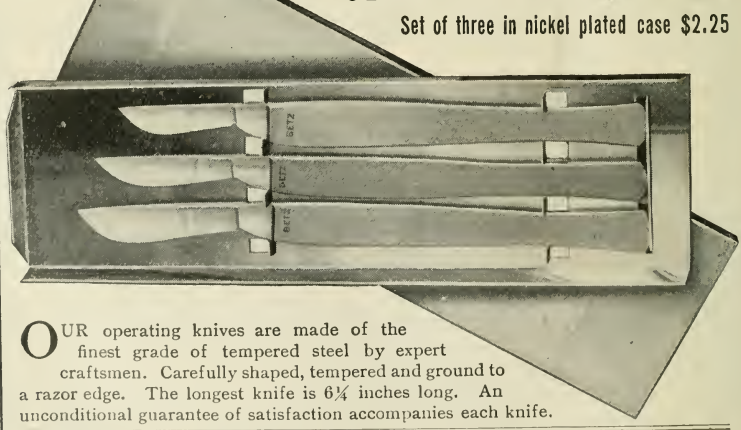

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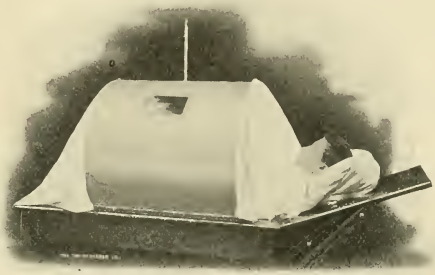

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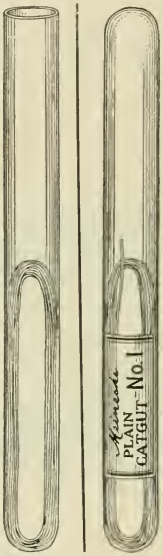

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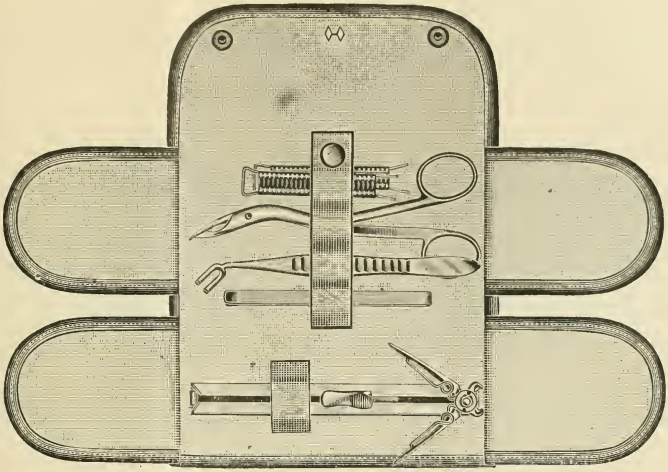

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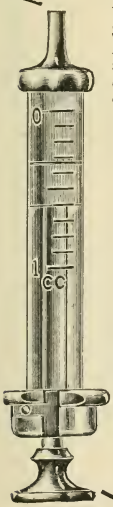

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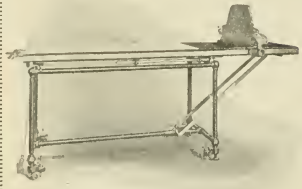

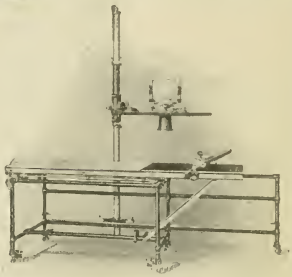

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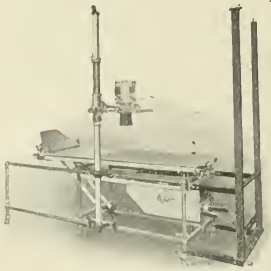

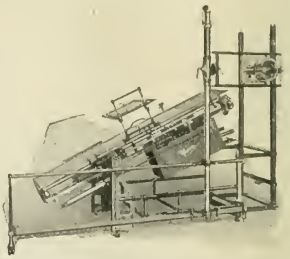

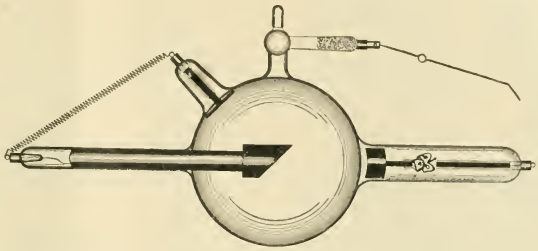

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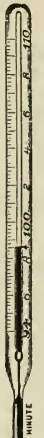

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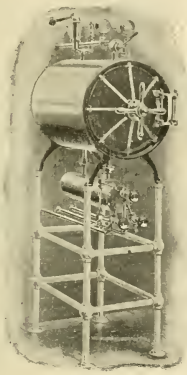

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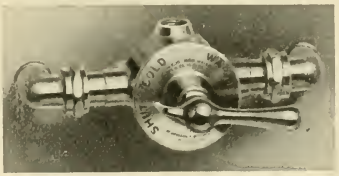

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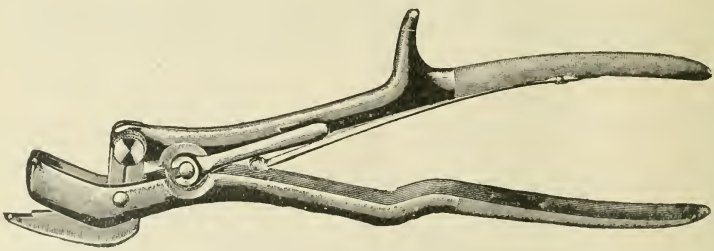

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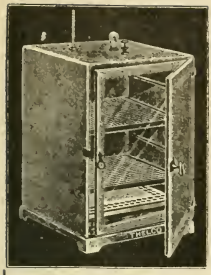

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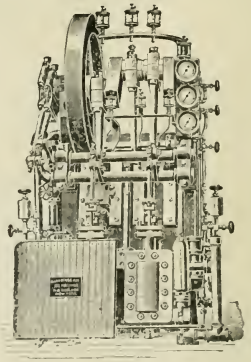

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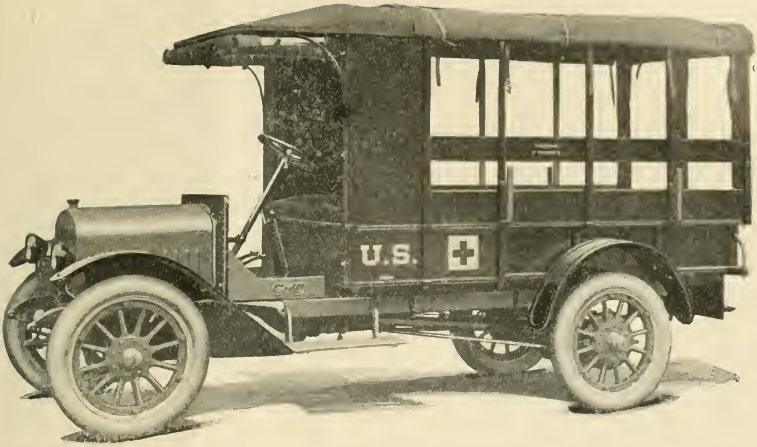

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TRUCKS

These illustrations show the G. M. C. Model 15, 1,500-pound truck, as used by the U. S. Army for field ambulance work.

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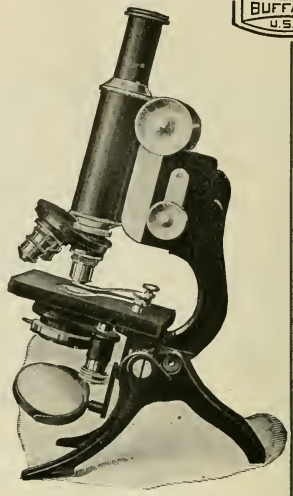

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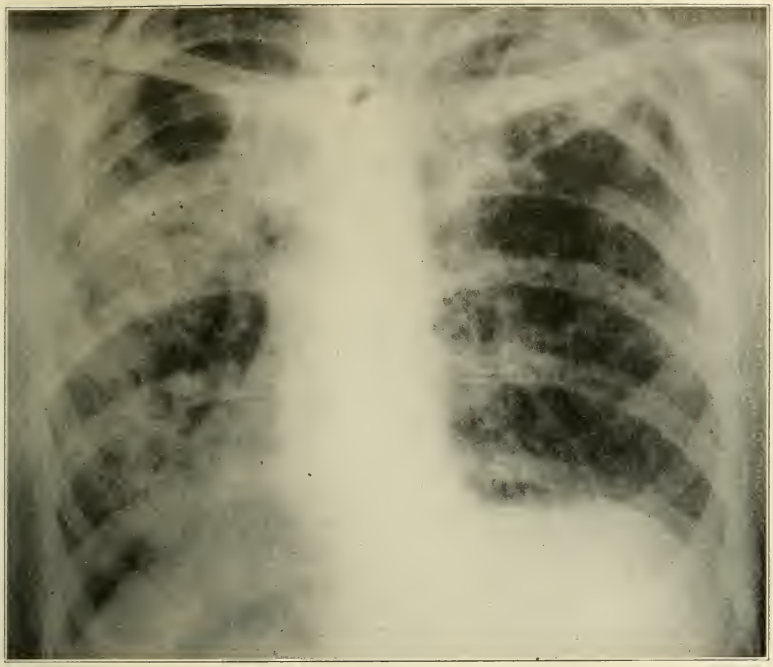

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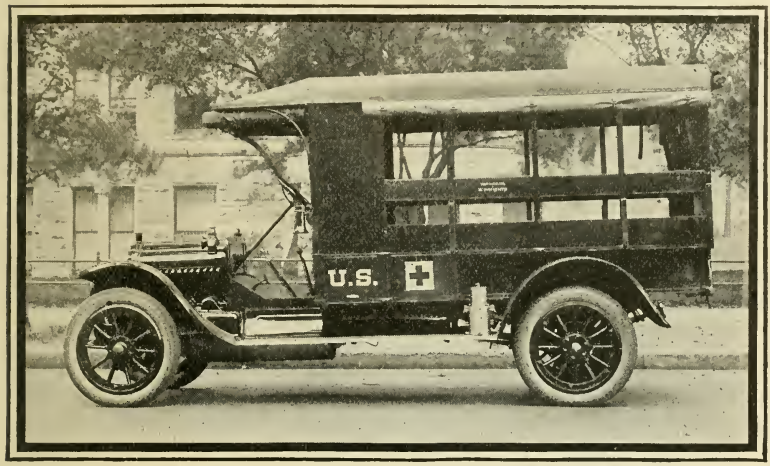

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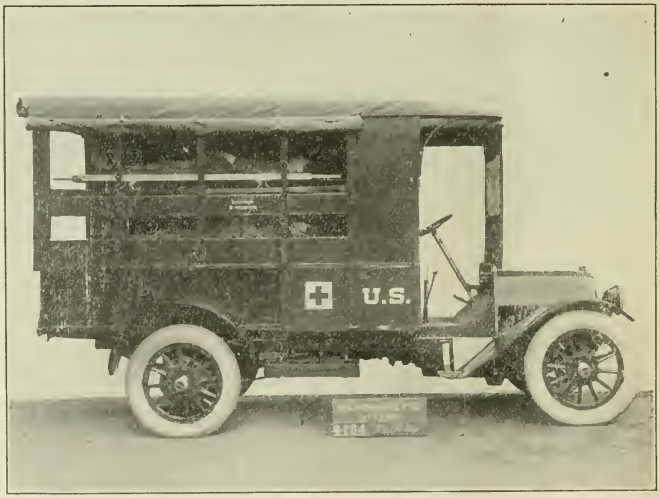

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